CR210HM

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A.2 Explanation of Node

A.2.1 Front side

A.2.1.1 Front side of a node

Figure A.2.1.1-1 shows the front side of a node.
When there is an instruction to press the power source button, press Power lamp switch.

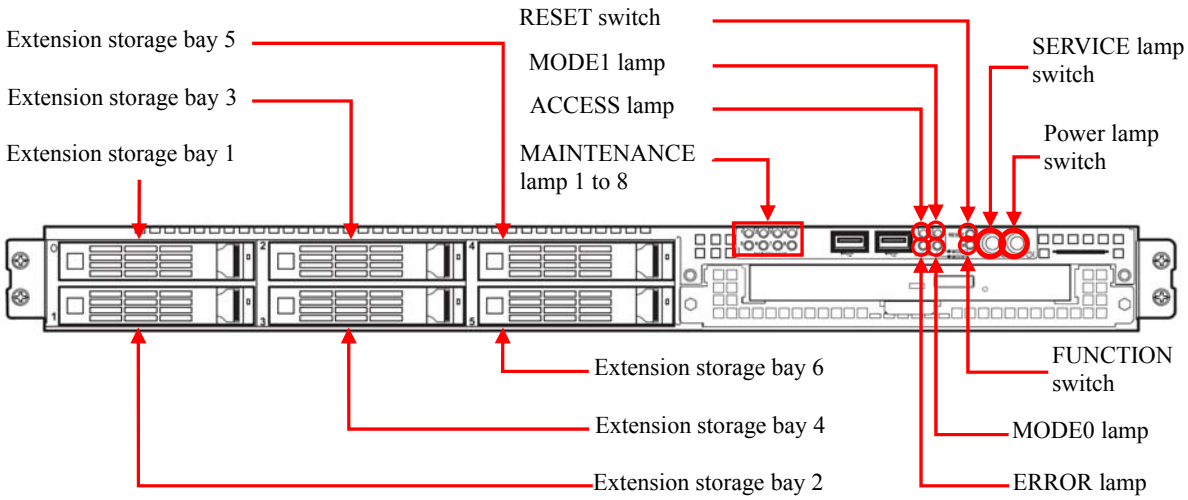

Figure A.2.1.1-1 Location of Power Lamp Switch, FUNCTION Switch, and SERVICE Lamp Switch

Figure A.2.1.2-1 shows the front side of a node at the time of installing a front bezel.

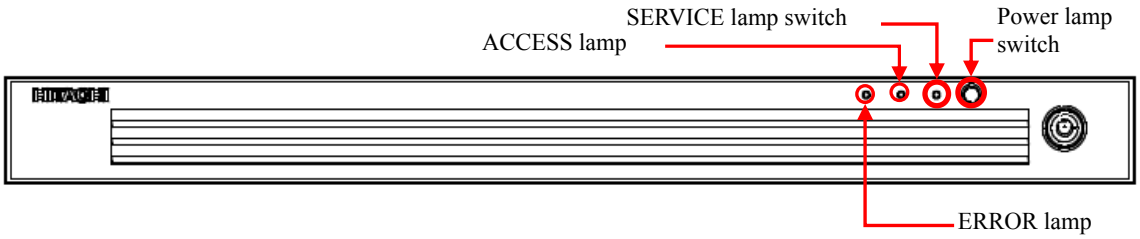

Figure A.2.1.1-2 Front bezel

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NOTE: Prepare a bezel key to install or remove a front bezel.
If the maintenance personnel do not have the bezel key, borrow it from the customer.

(1) The installation procedure of the front bezel

(1-1) Hook the tab inside the front bezel to the guide on the left side mounting bracket.

NOTE: The opening angle of the front bezel to the node must be less than 30 degrees, or the front bezel will be damaged.

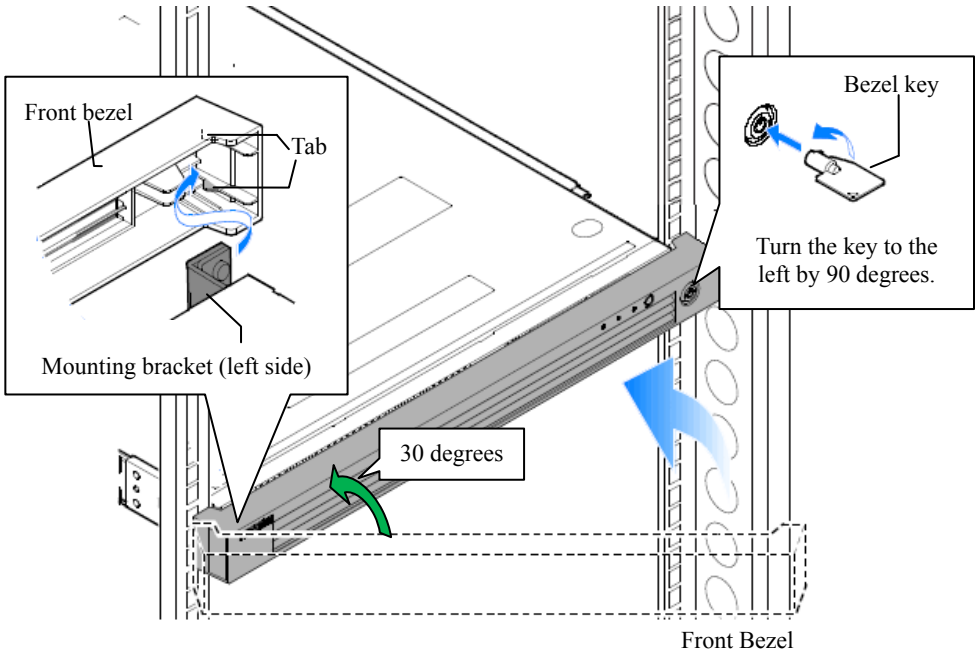

Figure A.2.1.1-3 Installing a Front bezel

(1-2) Push in the other side of the front bezel all the way.

(1-3) After pushing in, lock the front bezel with the bezel key.
A bezel key is fixed with adhesive tape inside the front bezel.

(2) The removal procedure of the front bezel

(2-1) Insert the key deeply into the key hole on the front bezel and turn it to the right by 90 degrees (or until the key would not turn).

(2-2) Perform the reverse procedure of "(1) The installation procedure of the front bezel."

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A.2.2 Back side

A.2.2.1 Power source unit

Figure A.2.2.1-1 shows the mounted location of the power source unit. And Table A.2.2.1-1 shows the display status of the power source lamp.

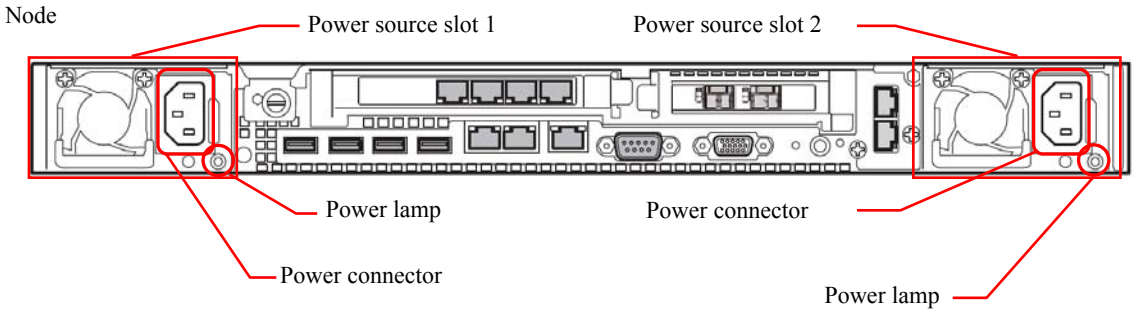

Figure A.2.2.1-1 Location of the mounted power source unit

Table A.2.2.1-1 Display status of the power source lamp of the power source unit

#	Display status of the power source lamp	Operation status
1	Turned off	No AC power supplied (the power source cord is unconnected.)
2	Blinking in green light	AC power supplied and Stand-by status (the power source code is connected, but the power switch is OFF.)
3	Turn on in green	Power ON and the normal operation (Power switch is ON.)
4	Blinking in amber light	Warning condition (the ambient temperature is high, etc.)
5	Turn on in amber	An error occurred. (a failure occurred or the power source code is dropped.)

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A.2.2.2 Port arrangement and port names

(1) Node of CR210HM in the cluster configuration
Figure A.2.2.2-1 shows the port names on the backside of a node.
When the maintenance tool is used, the port name of the diagram is shown.
'Table A.2.2.2-1 Confirmation Table for the Port Allocation of Node' shows the correspondence between the port names displayed on the maintenance CLI (names on the OS) and the actual port positions of a node.
(a) and (b) show the rear view of the node in each option card mounting pattern (2 patterns). Extension slot 2 and Mezzanine slot are fixed.

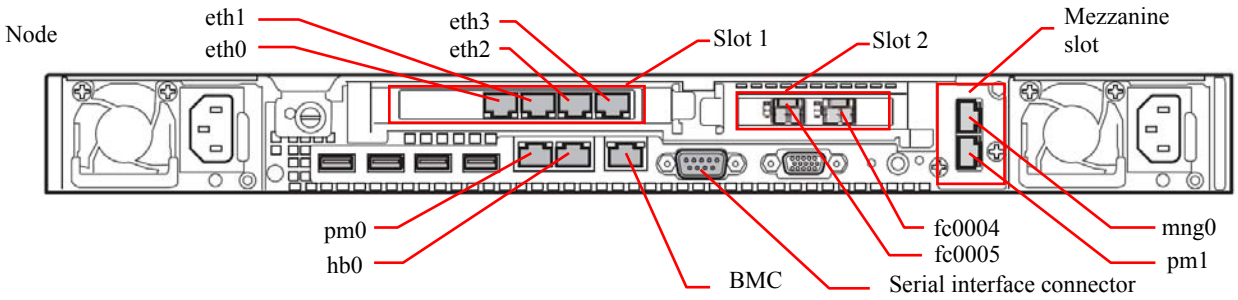

Figure A.2.2.2-1 Rear View of the Node (Example)

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Table A.2.2.2-1 Confirmation Table for the Port Allocation of Node

#	Position	Physical port name	Interface name			Application	Remarks
			GbE	10GbE	FC		
1	On-board	1	hb0			heartbeat port	—
2		2	pm0			Private Maintenance port	—
3		M	— (none)			BMC	—
4	Mezzanine	3	mng0			Management port	PCI-Express gen3<×8>
5		4	pm1			BMC communication port	
6	Extension slot 1	0		xgbe1		Data port	PCI-Express gen3<×16>
7		1	eth0	xgbe0		Data port	
8		2	eth1			Data port	
9		3	eth2			Data port	
10		4	eth3			Data port	
11	Extension slot 2	0			fc0004	Connecting a FC port and the disk array subsystem	PCI-Express gen3<×8>
12		1			fc0005	Connecting a FC port and the disk array subsystem	

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The following shows the two built-in patterns by the combination of the option card.

(a) Mounting 4 port GbE card in the extension slot 1

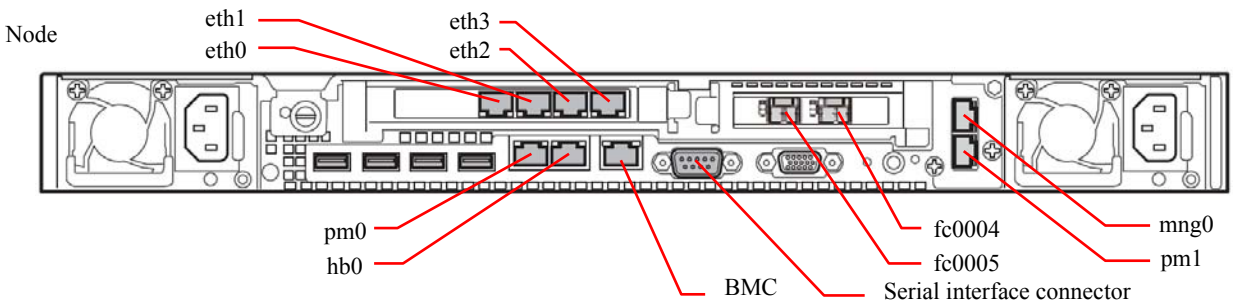

Figure A.2.2.2-2 Rear View of the Node (1)

(b) Mounting 2 port 10 GbE card in the extension slot 1

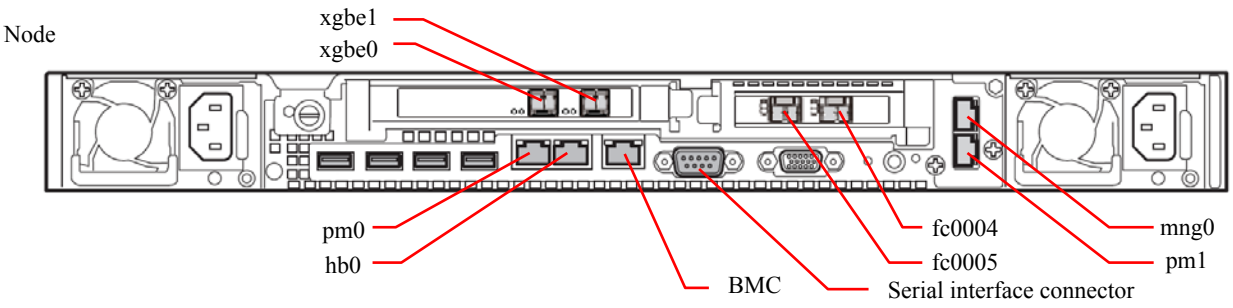

Figure A.2.2.2-3 Rear View of the Node (2)

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(2) Node of CR210HM in the single node configuration
HDI does not support.

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A.2.3 LAN Cable

NOTE: When using the customer's management LAN IP-SW, request the customer to connect the connections of #1 to #4 of Management VLAN ports shown in the Figure A.2.3.1-1 to the 4 of 6 ports provided by the customer.

A.2.3.1 In the Case of Cluster Configuration shows the LAN cable connection when it is cluster configuration.

A.2.3.1 In the case of cluster configuration

Note that No. 9 port of the management LAN IP-SW is unoccupied port because it is an alternative port for No.1 or No.3 port of the Management LAN IP-SW in case when problem occurs.
However, if the No.9 port is occupied with the use of HiTrack, No.8 port is used as an alternative port.

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(1) Connecting the management system network

Connect the management port (mng) of node0 to port 1 on the management LAN IP-SW, and connect the BMC of node0 to port 2 on the management LAN IP-SW.
Connect the management port (mng) of node1 to port 3 on the management LAN IP-SW, and connect the BMC of node1 to port 4 on the management LAN IP-SW.
Connect the management server to port 7 on the management LAN IP-SW.

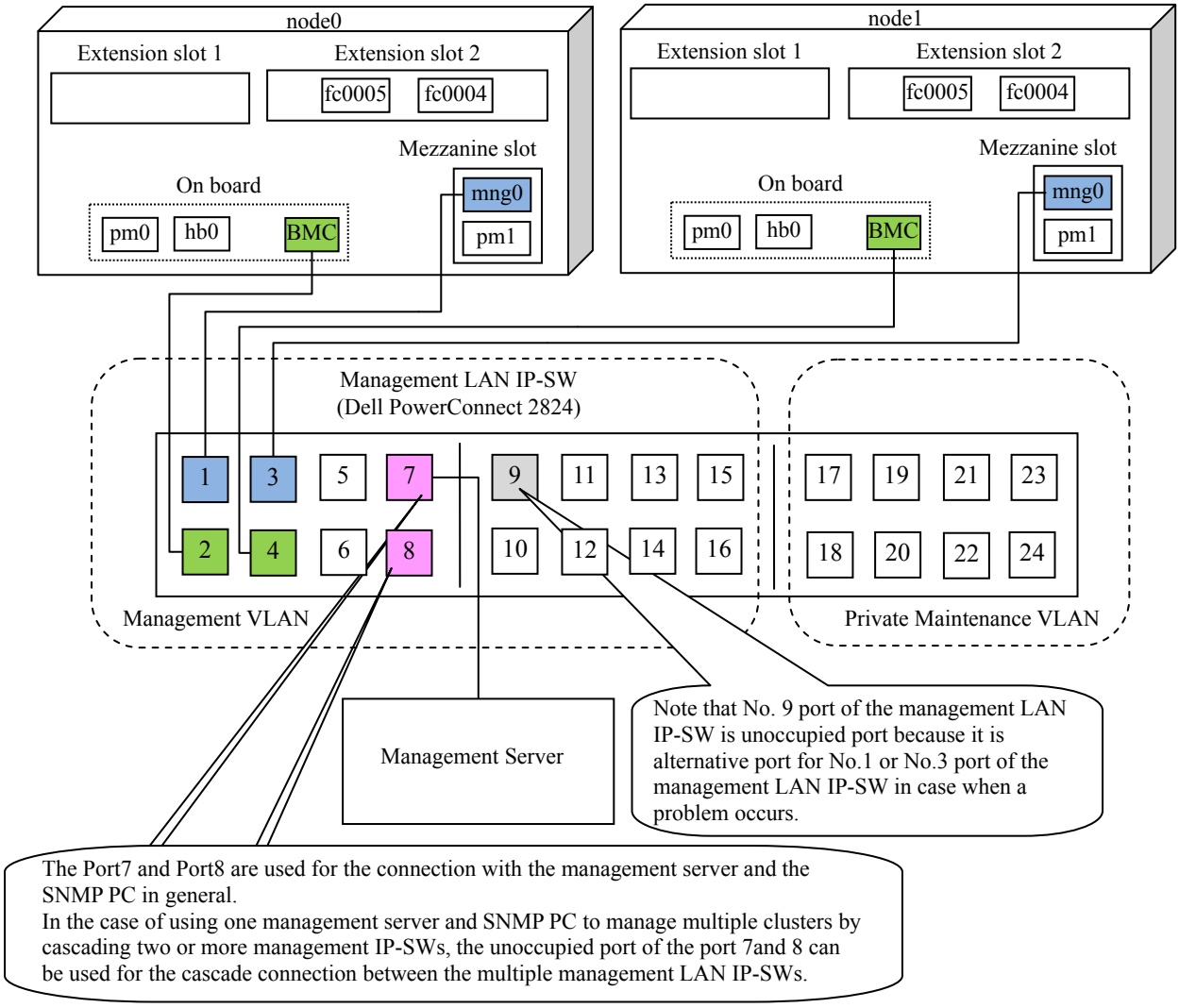

Figure A.2.3.1-1 Connection Diagram for the Management System Network

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Figure A.2.3.1-1-1 shows an example of connection diagram in the case the OS version is 3.2.2-XX or later and in the BMC direct connection configuration.
Ports on the management LAN IP-SW which will be connected to the management port (mng0) on each node can be chosen arbitrarily.

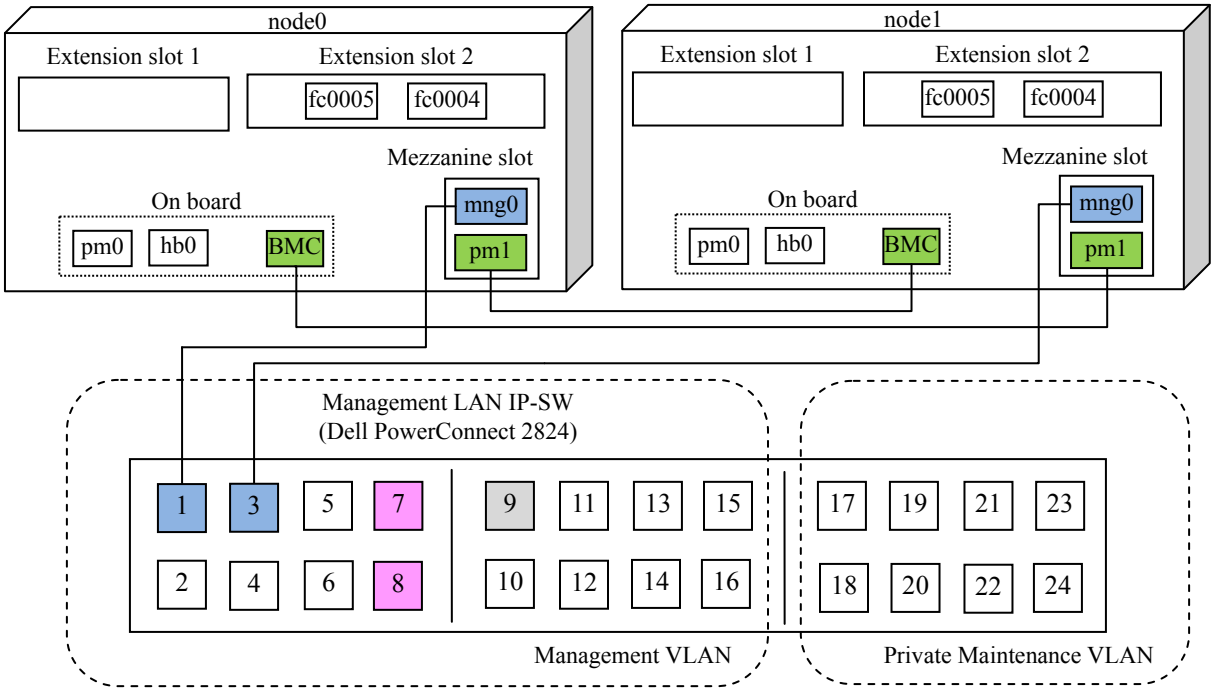

Figure A.2.3.1-1-1 Connection Diagram for the Management System Network (BMC Direct Connection Configuration)

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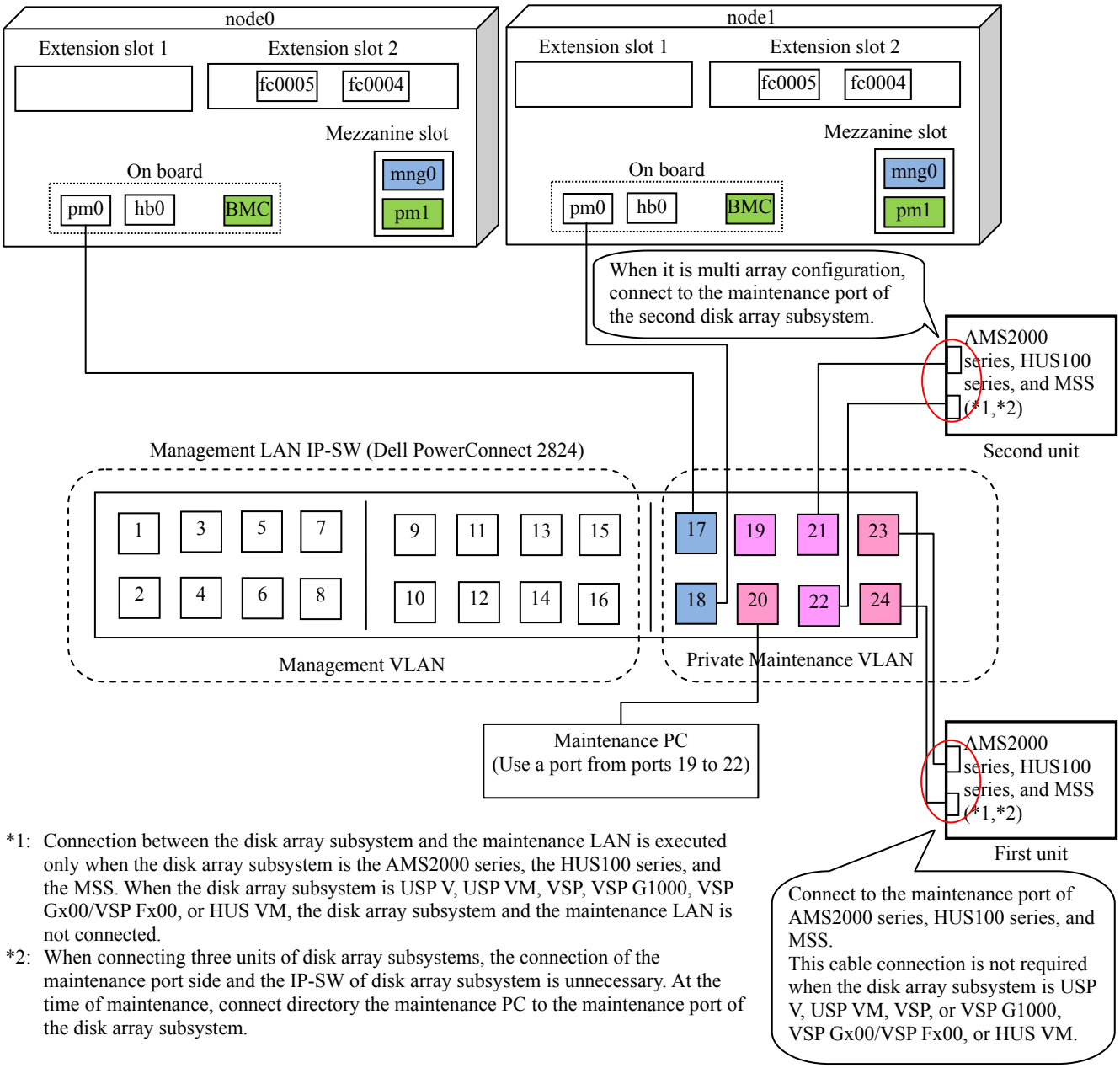
(2) Connecting the private maintenance ports

NOTE: This connection is unnecessary when the customer's management LAN IP-SW is used.

Connect the private maintenance port (pm) of node0 to port 17 on the management LAN IP-SW.
Connect the private maintenance port (pm) of node1 to port 18 on the management LAN IP-SW.
When you use a maintenance PC, connect it to a free port from ports 19 to 22 on management LAN IP-SW.



*1: Connection between the disk array subsystem and the maintenance LAN is executed only when the disk array subsystem is the AMS2000 series, the HUS100 series, and the MSS. When the disk array subsystem is USP V, USP VM, VSP, VSP G1000, VSP Gx00/VSP Fx00, or HUS VM, the disk array subsystem and the maintenance LAN is not connected.

*2: When connecting three units of disk array subsystems, the connection of the maintenance port side and the IP-SW of disk array subsystem is unnecessary. At the time of maintenance, connect directory the maintenance PC to the maintenance port of the disk array subsystem.

Figure A.2.3.1-2 Private Maintenance Port Connection Diagram

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(3) Connecting the heartbeat ports

Connect the heartbeat ports (hb) of nodes 0 and 1.
For the LAN cable to connect the heartbeat port, the 5E or more categories is required.

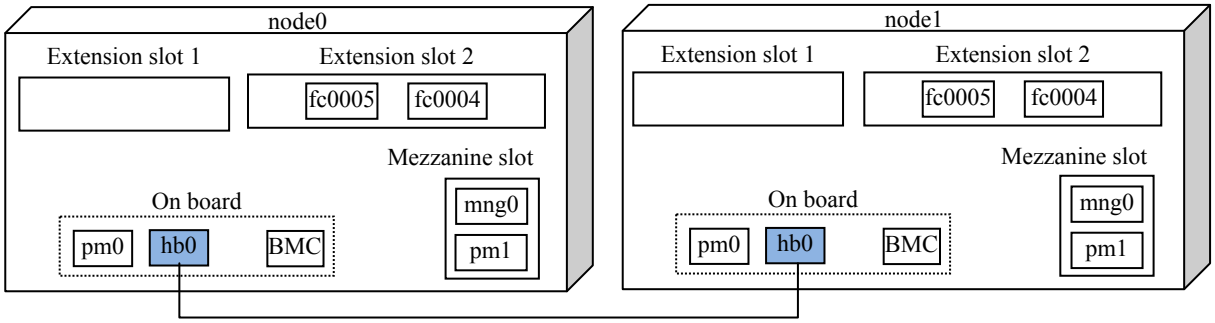

Figure A.2.3.1-3 Heartbeat Port Connection Diagram

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(4) Connecting the management LAN IP-SW and the disk array subsystem

Disk array subsystems are connected to the management LAN only for the AMS2000 series or HUS100 series. They are not necessary to be connected to the management LAN for USP V, USP VM, VSP, VSP G1000, VSP Gx00/VSP Fx00, or HUS VM. If disk array subsystems are connected, connect them to #5 or #6.

Connect ports 5 and 6 on the management LAN IP-SW to the user management port (LAN1) on the disk array subsystem (first unit).
When connecting one more disk array subsystem, connect the disk array subsystem to the port 11 and 12 on the management LAN IP-SW. When connecting third unit of disk array subsystem, apply cascade connection by connecting the disk array subsystem to the port 13 and 14 or add an IP-SW or connect the disk array subsystem to the port 15 and 16 if the port 15 and 16 on the management VLAN are unoccupied.

NOTE: When using the customer's management LAN IP-SW, request the customer to connect the connections of #5 to #6 of Management VLAN ports shown in the Figure A.2.3.1-4 to the 2 of 6 ports provided by the customer.

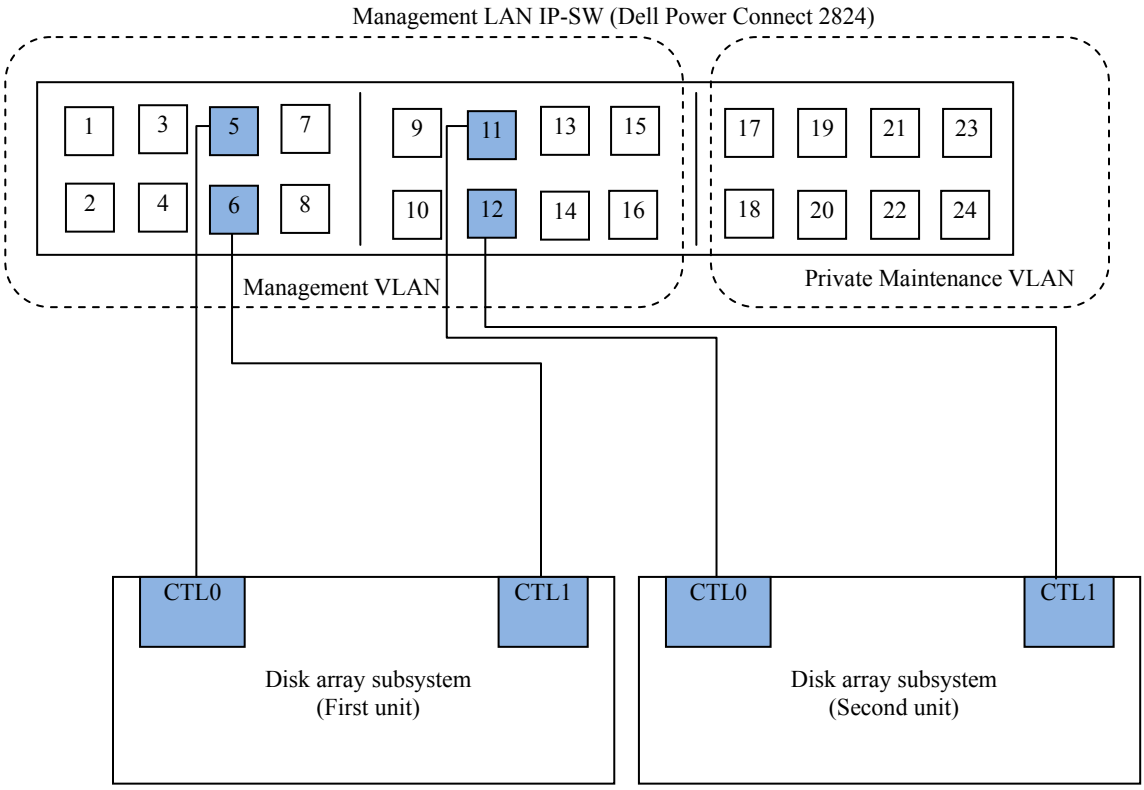

Figure A.2.3.1-4 Connection Diagram for the Management LAN IP-SW and the Disk Array Subsystem

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(5) Connecting the front-end LAN

NOTE: When using the HiTrack in the configuration of HDI for HCP, the customer's Management LAN IP-SW and front-end LAN are needed to be connected.

Connect port 10 on the management LAN IP-SW to the router.
Connect the router to the front-end LAN.
Router is connected only when the system environment is the configuration of HDI for HCP, and a customer makes a contract of Hi-Track with HDS.

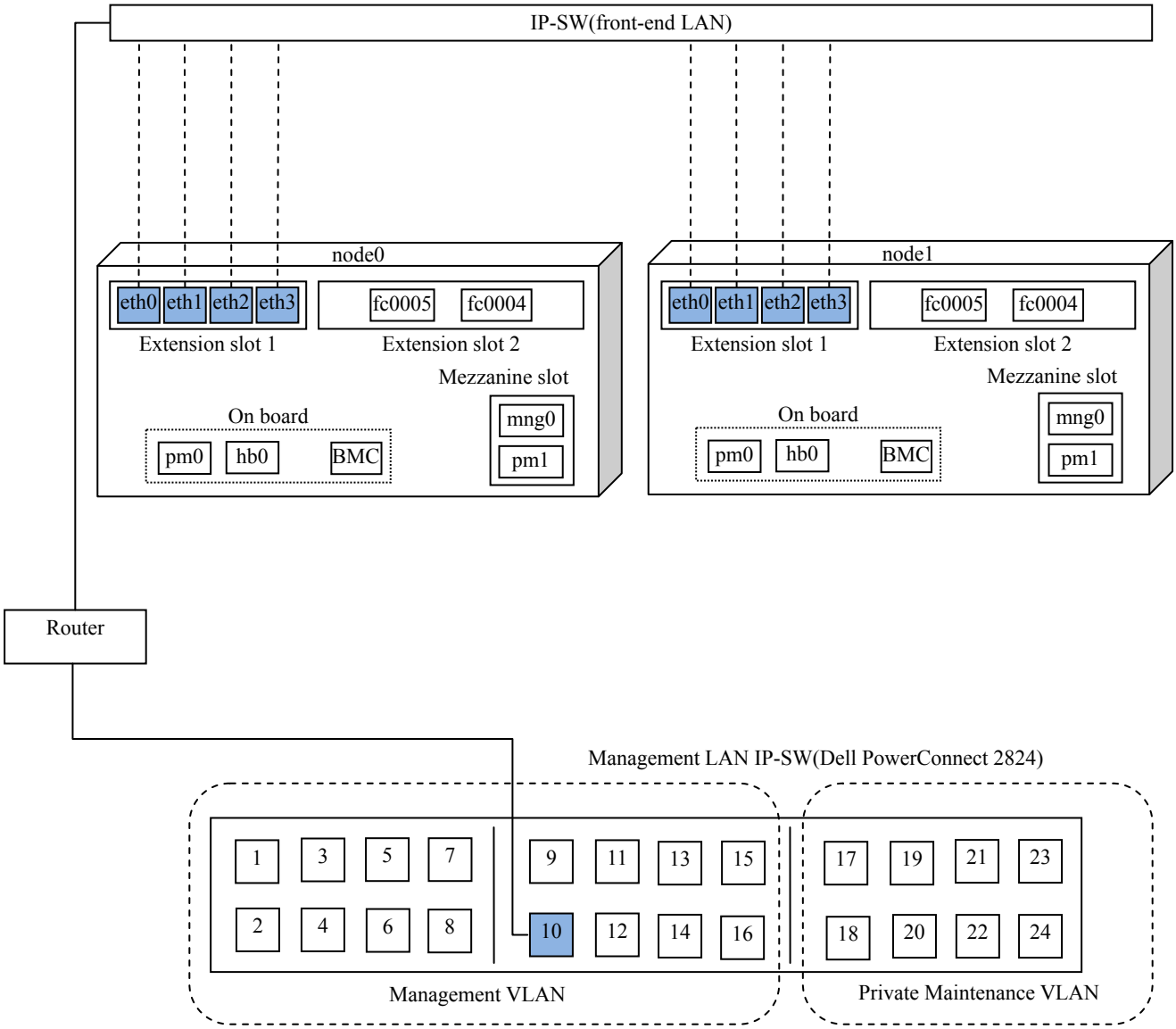

Figure A.2.3.1-5 Front-end LAN Connection Diagram

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(6) Connecting the HiTrack PC

NOTE: When using the customer's management LAN IP-SW, request the customer to connect the HiTrack PC to the customer's management LAN IP-SW.

Figure A.2.3.1-6 shows the HiTrack PC connection diagram. (Either HiTrack or SNMP is required.)

Connect the HiTrack PC to port 9 on the management LAN IP-SW.
When you use SNMP, connect it to port 8 on the management LAN IP-SW.

HiTrack monitors HDI via the management LAN.
It also monitors the HCP node via the connection with the front-end LAN described in (5).

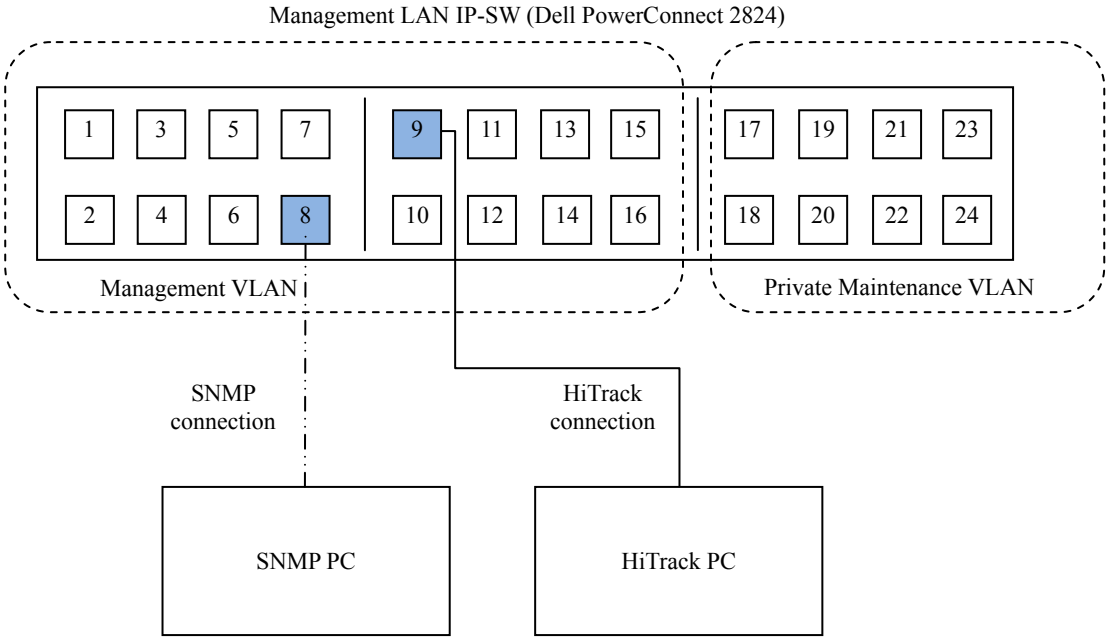

Figure A.2.3.1-6 HiTrack PC Connection Diagram

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A.2.3.2 In the case of single node configuration

HDI does not support.

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A.2.4 Notes on Port when Maintenance Mode is Used

This is unsupported mode in this model.

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A.4 Installing the Nodes

A.4.1 Example of Installing the Node in the Basic Configuration (cluster node)

HDI does not support Basic Configuration.

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A.4.2 Example of Installing the Node in the Basic Configuration (single node)

HDI does not support Basic Configuration.

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A.4.3 Example of Installing the Node in the Configuration of HDI for HCP (cluster node)

CAUTION

To prevent a rack frame fall, install the heavier devices on the lower positions as much as possible. The devices must be installed in the order of a position from the bottom. Please make sure when you install nodes on your rack frame.

The following figure shows an example of installing the nodes of Hitachi Data Ingestor on a rack on which the Hitachi Content Platform has been installed.
Installing Hitachi Data Ingestor including Management LAN IP-SW requires a 3U rack space. Figure A.4.3-1 shows an example of installing the basic chassis of AMS2000 series and three extension chassis mounted from the bottom of the rack frame. In this case, totally 13U rack spaces are required with the basic chassis and three extension chassis.
When connecting with USP V, USP VM, or VSP, the disk array subsystem will not be installed on a rack frame of which the node is installed.

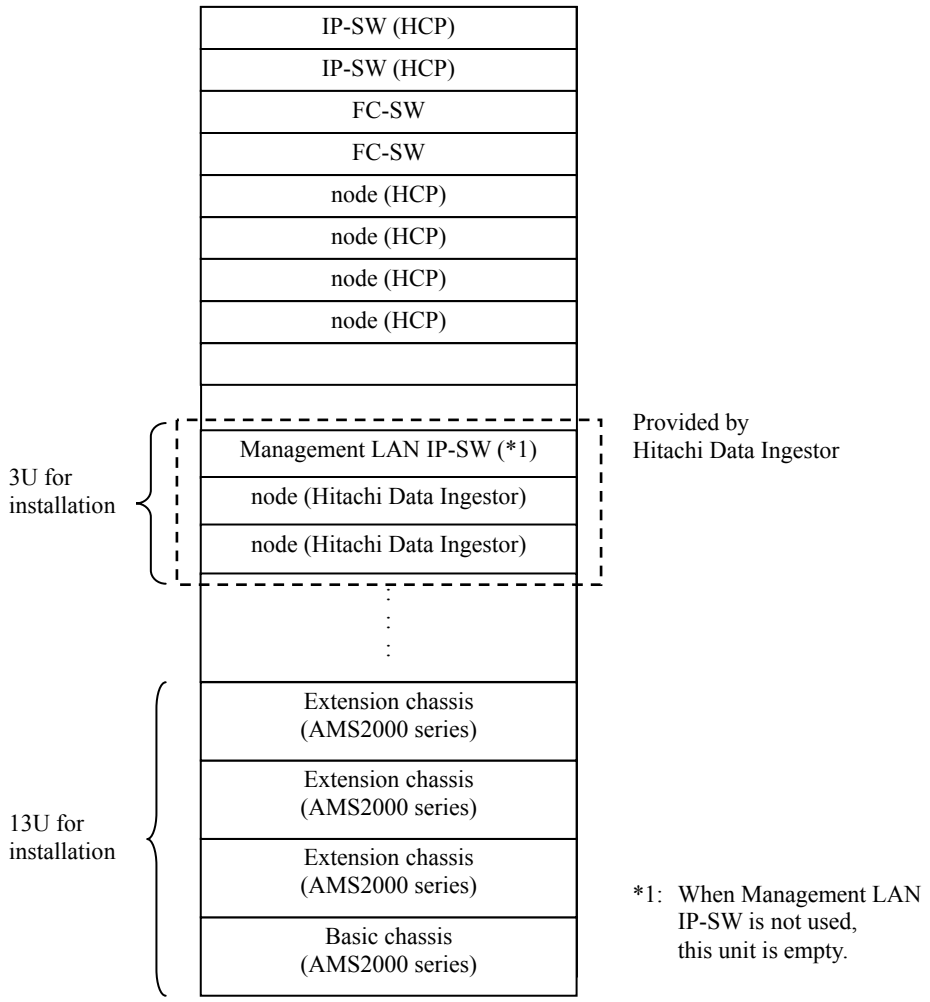

Figure A.4.3-1 Example of Installing the node in the Configuration of HDI for HCP

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A.4.4 Example of Installing the Node in the Configuration of HDI for HCP (single node)

HDI does not support configuration of HDI for HCP (single node).

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A.4.5 Example of Installing the Node in the Configuration of HDI for Cloud (cluster node)

CAUTION

To prevent a rack frame fall, install the heavier devices on the lower positions as much as possible. The devices must be installed in the order of a position from the bottom. Please make sure when you install nodes on your rack frame.

The disk array subsystem in the figure shows an example with AMS2000 series.

Figure A.4.5-1 shows an example of installing the nodes of HDI for Cloud configuration (cluster node).

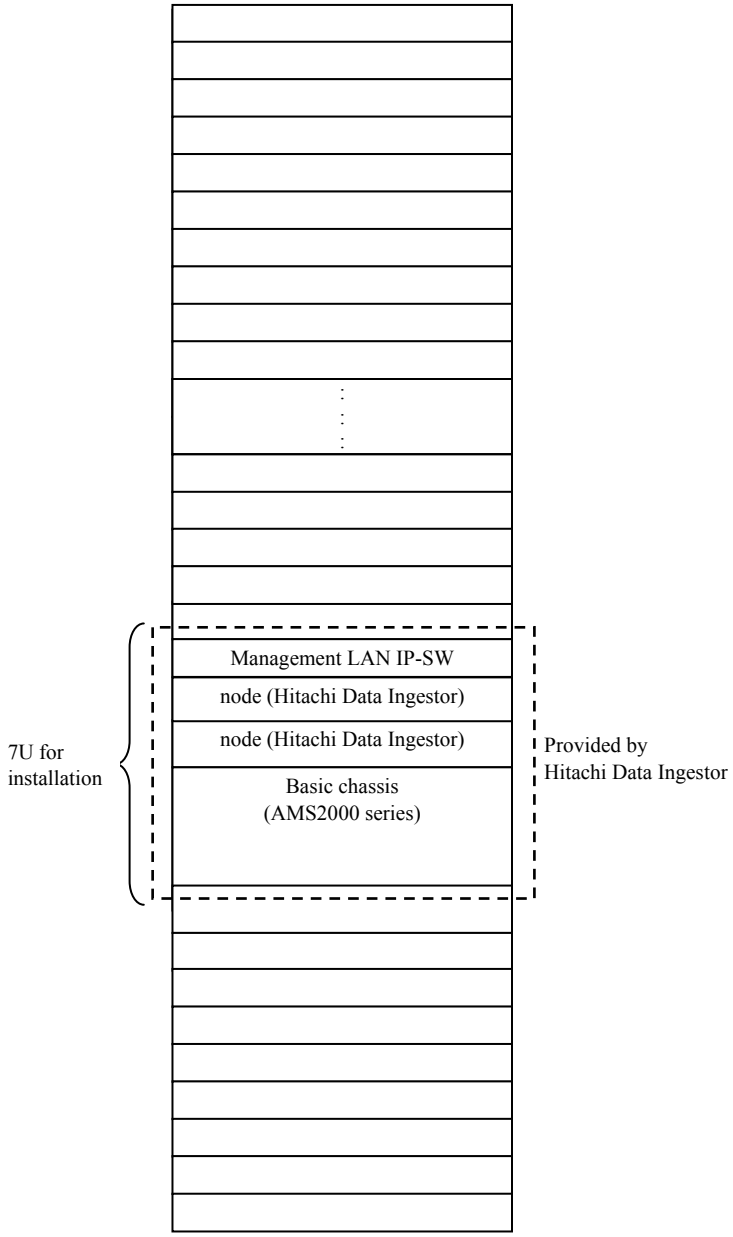

Figure A.4.5-1 Example of Installing the node in the Configuration of HDI for Cloud (cluster node)

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A.4.6 Example of Installing the Node in the Configuration of HDI for Cloud (single node)

HDI does not support configuration of HDI for Cloud (single node).

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B.1 Connection and Confirmation of OS Console

B.1.1 Confirmation of KVM Connection

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B.1.3 Connection Confirmation of the Remote Console

B.1.4 Startup Confirmation of OS by Using Remote Console

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B.1 Connection and Confirmation of OS Console

There are two methods of connection to the console of OS. One is the connection with KVM, and the other is the connection with remote console.

KVM is an input/output device with a hardware display monitor, and the command operation for the node can be executed. Generally, KVM can connect to multiple nodes and it uses by switching nodes. Note that KVM is not used in this model.

Remote Console is a function that can be executed a command operation for the node on a screen of a maintenance PC by installing the remote console application to the maintenance PC. Remote console uses in the case other than installation operation and BMC failures.

For more details about Remote Console Application, refer to “Remote Console Application User’s Guide”.

B.1.1 Confirmation of KVM Connection

Refer to ‘B.1.3 Connection Confirmation of the Remote Console’ in this model.

B.1.2 Startup Confirmation of the OS by Using KVM

Refer to ‘B.1.4 Startup Confirmation of OS by Using Remote Console’ in this model.

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B.1.3 Connection Confirmation of the Remote Console

NOTE: In the case of BMC port failure, borrow a monitor and a keyboard from the system administrator to connect to the node.

The console must be available to use before executing setup operation. Confirm that the following descriptions are connected certainly.

(1) Verify that the power source cable of the maintenance PC is connected.
(2) Verify that the network segment of the BMC port and the network segment of the maintenance PC are the same.

If the network segment is different, change the setting of maintenance PC to be the same network segment. The following shows the conceivable IP address of the BMC port.

- Before the setup, the IP address may be 192.168.100.100.
- After the setup, the IP address may be the following.

[node0] is [192.168.0.22], and [node1] is [192.168.0.23].

If the IP address of the BMC port is other than the above IP address, confirm with the system administrator.

(3) Verify that the LAN port of the maintenance PC and the BMC port of the node are connected with a LAN cable (cross-cable).

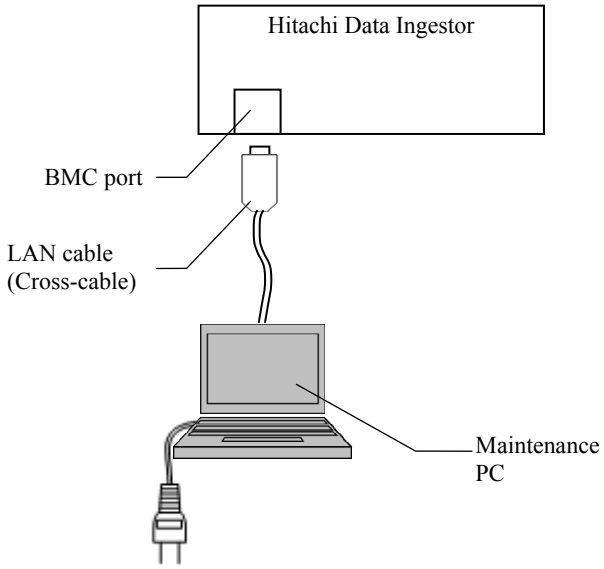

Figure B.1.3-1 Remote console connection example

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B.1.4 Startup Confirmation of OS by Using Remote Console

If the OS is already installed, it is available to check if the OS is running or not with using the console window.

This procedure assumes that the connection confirmation of the console with the description of ‘B.1.3 Connection Confirmation of the Remote Console’.

The following shows the procedure.

(1) Start up the Internet Explorer from the maintenance PC.
Click [Start]-[Program]-[Internet Explorer].

(2) Input the following address in the address bar on the Internet Explorer.
“http://<IP address of the BMC>”

Input the IP address confirmed at ‘B.1.3 Connection Confirmation of the Remote Console’ for the IP address of the BMC.

(3) Make sure that the BMC login window is displayed.

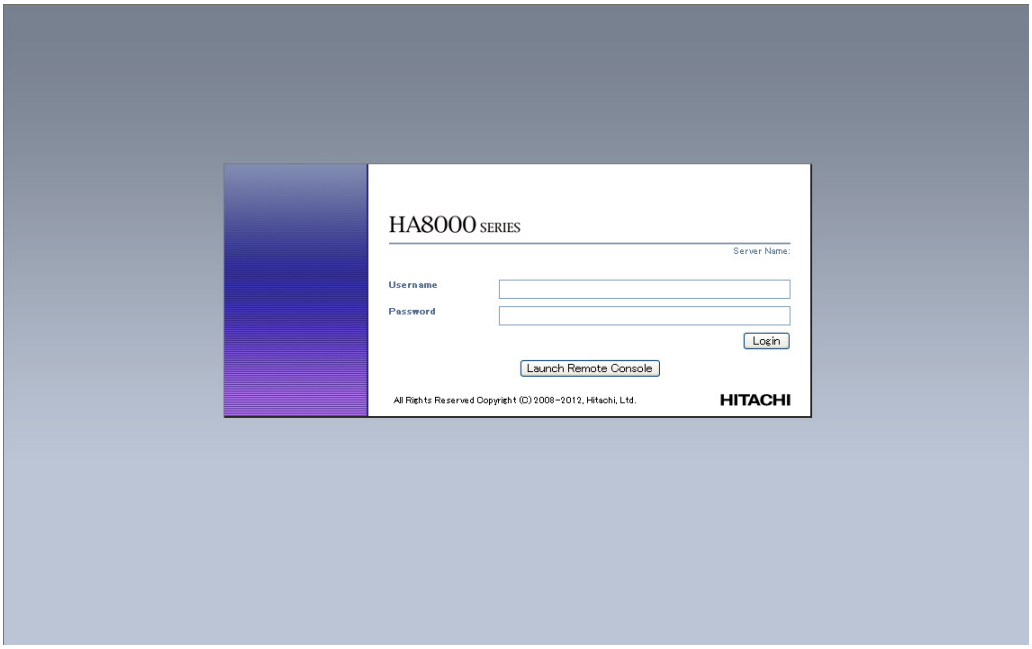

Figure B.1.4-1 BMC Login window 1

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(4) Enter “ceconsl” in the [Username], and “cepasswd” in the [Password].
After the input, click [Login].

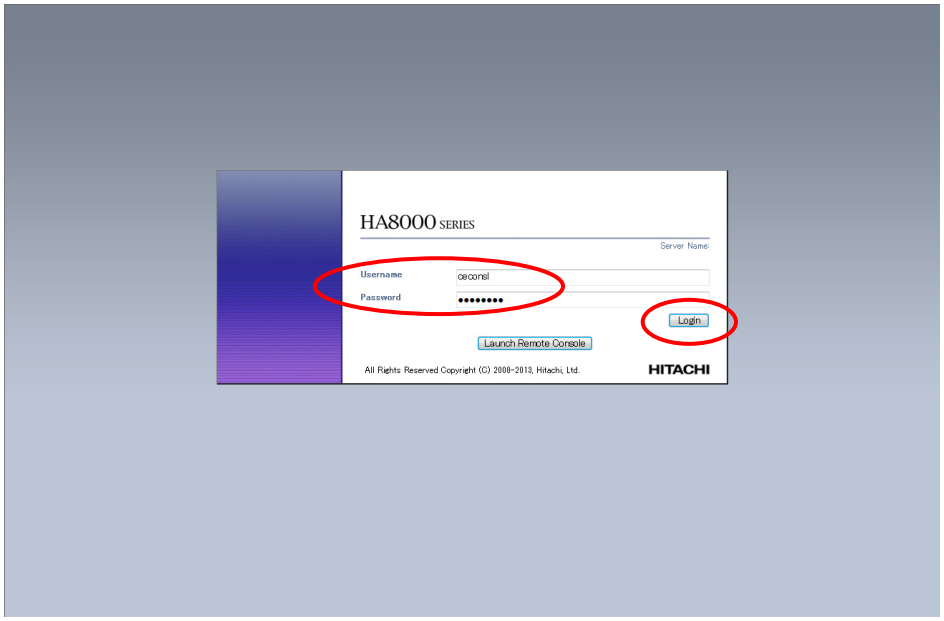

Figure B.1.4-2 BMC Login window 2

(5) The Server Information window is displayed as shown in Figure B.1.4-3.
Click [Server Settings].

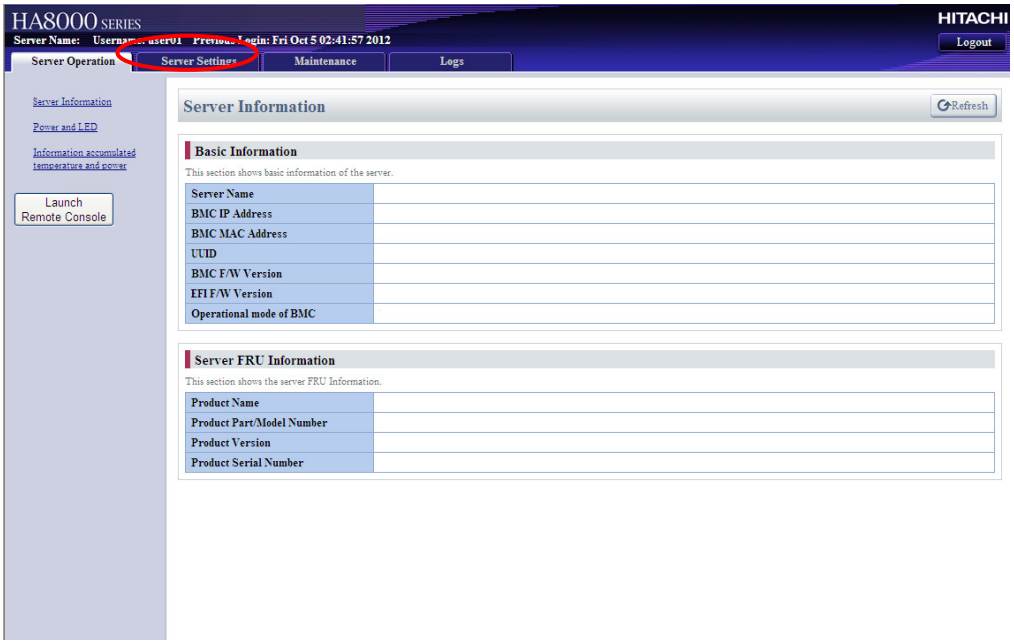

Figure B.1.4-3 Server Information window

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(6) The Language Settings window is displayed as shown in Figure B.1.4-4.
Click [Remote KVM].

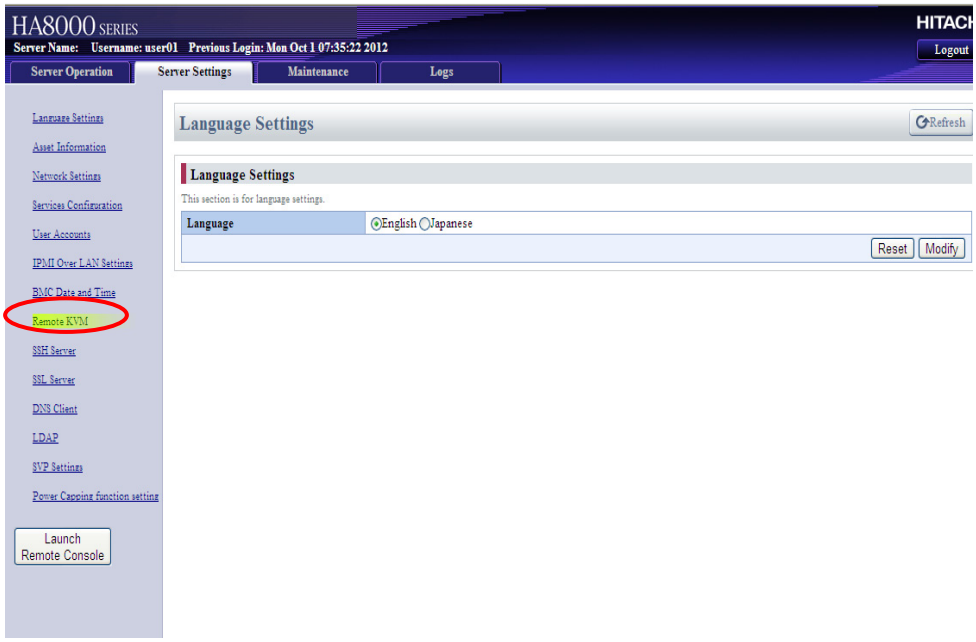

Figure B.1.4-4 Language Settings window

(7) The Remote KVM Settings window is displayed as shown in Figure B.1.4-5.
Select [RELATIVE Mode], and click [Modify].

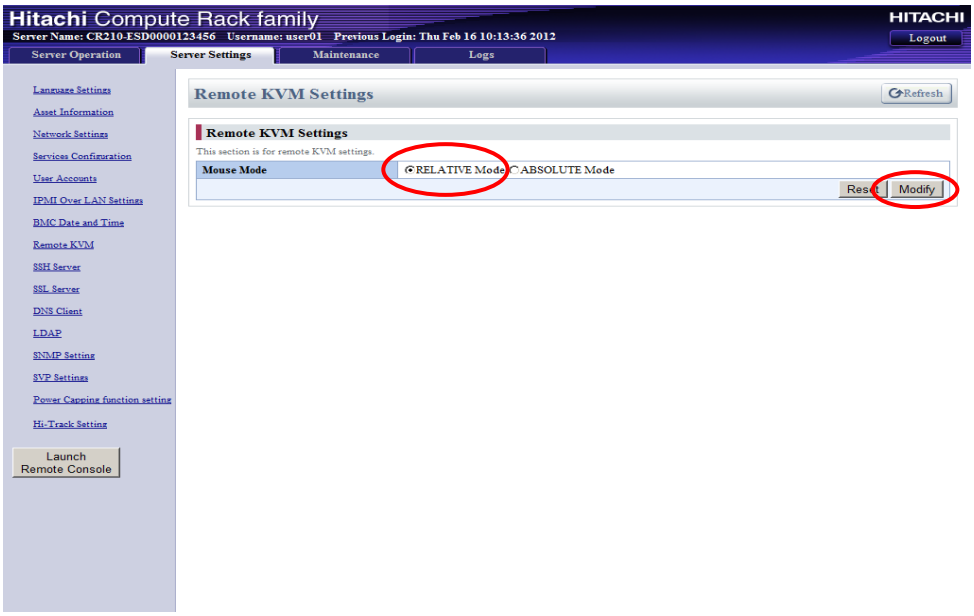

Figure B.1.4-5 Remote KVM Settings window

NOTE: When using a mouse in “RELATIVE” mode, the mouse cursor of the console terminal and that of the remote console window may point different positions depending on the OS of the system. It is recommended to hide the mouse cursor of the console terminal.

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(8) Launch Remote Console.
If you have logged in to the BMC, perform the steps from (a-1) to (a-3).
If you have not logged in to the BMC, perform the step (b-1) and step (b-2).

(a-1) Click [Launch Remote Console] button on the left side of the window.

Figure B.1.4-6 Server Information window 2

(a-2) The Launch Remote Console window is displayed as shown in Figure B.1.4-7. Enter “ceconsl” in [User ID], “cepasswd” in [Password], and then click [Connect] button.

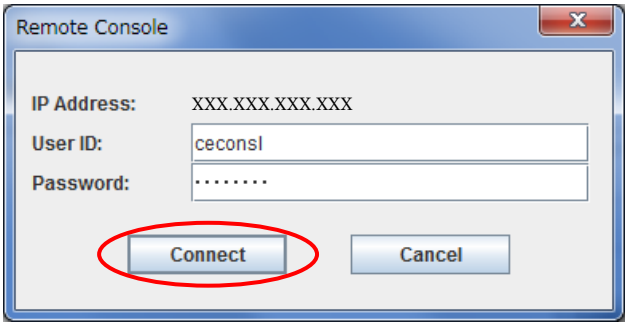

Figure B.1.4-7 Launch Remote Console window 1

NOTE: If the JRE version of the maintenance PC is JRE 7 update21 or later, a security warning may be displayed and the remote console may not be activated.
Refer to “Maintenance Tool ‘1.2.1 Requirements for the maintenance PC’ (MNTT 01-0030).”

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(a-3) Log out by clicking [Logout] button on the upper right of the window. The Console window shown in Figure B.1.4-11 will be displayed, and make sure not to close this window.

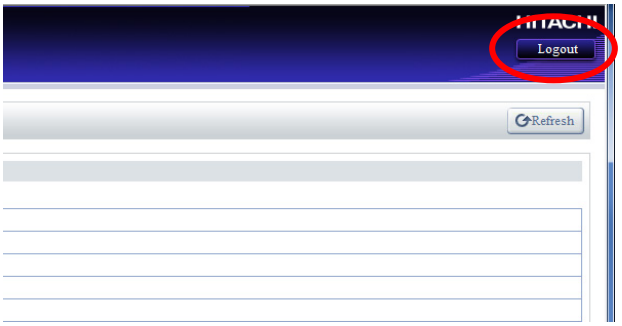

Figure B.1.4-8 Web Console window

NOTE: If you close the browser before logging out, the log-in status is held for 30 minutes until automatic logout is activated. Up to two users can log in to the Web console at the same time, so you cannot log in if two users have already logged in.

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(b-1) Click [Launch Remote Console] button on the BMC Login window.

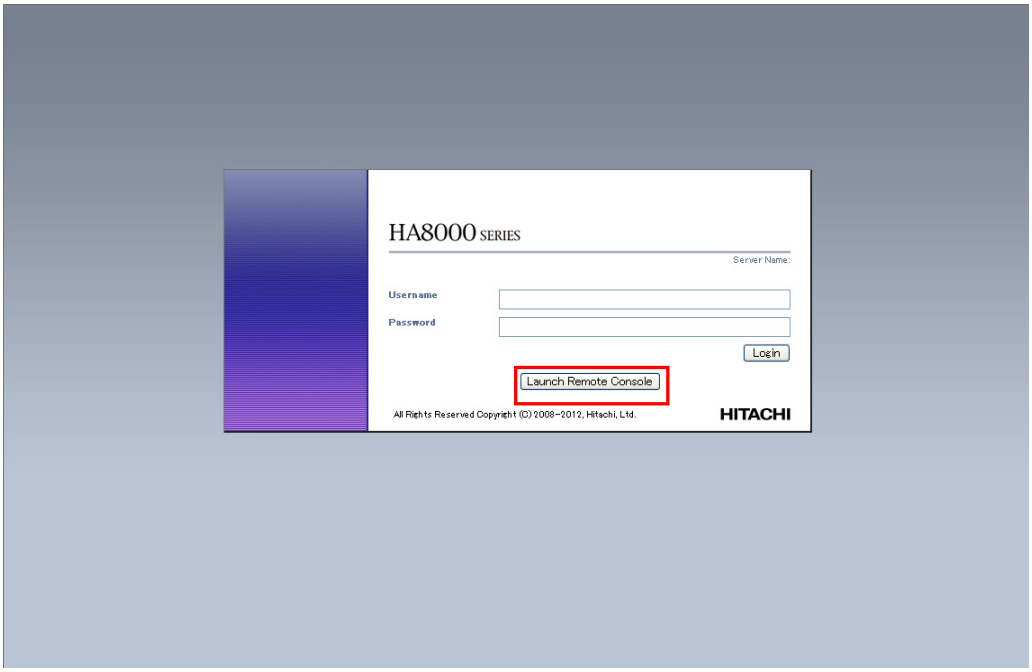

Figure B.1.4-9 BMC Login window 3

(b-2) The Launch Remote Console window is displayed as shown in Figure B.1.4-10. Enter “ceconsl” in [User ID], “cepasswd” in [Password], and then click [Connect] button.

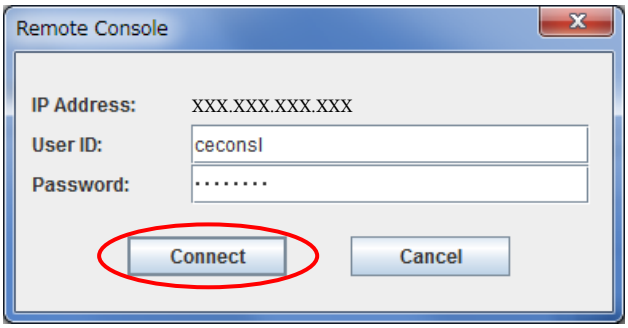

Figure B.1.4-10 Launch Remote Console window 2

NOTE: If the JRE version of the maintenance PC is JRE 7 update21 or later, a security warning may be displayed and the remote console may not be activated.
Refer to “Maintenance Tool ‘1.2.1 Requirements for the maintenance PC’ (MNTT 01-0030).”

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(9) Confirm that the Console window as shown in Figure B.1.4-11 is displayed.

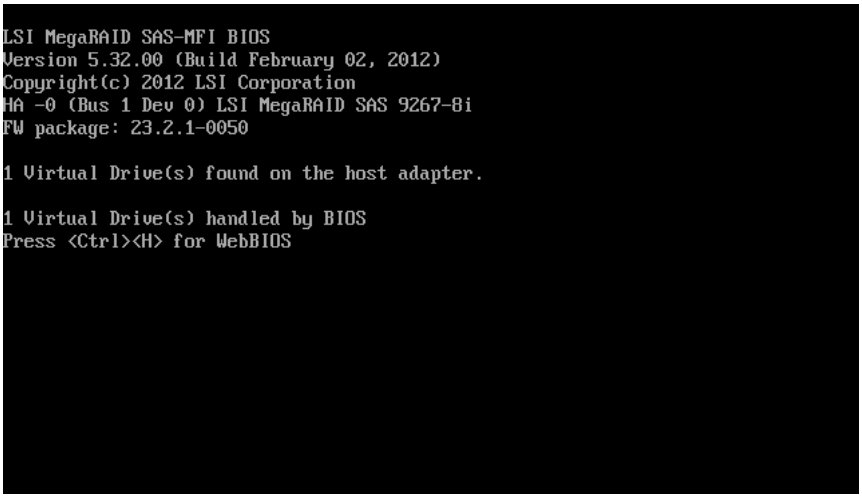

Figure B.1.4-11 Console window 1

NOTE:
- If there is no operation for 15 minutes after login, the user to be logged out automatically. In that case, login again.
- Be careful with keystrokes while using the remote console. The console window will be closed by pressing [Enter] key while holding down [Alt] key.
- To restart the node while using the remote console, hold down [Alt] key and press [L] key.
- If the window remain black and you cannot see anything on it, click [Video] on the upper console window, and then click [Refresh screen] on the pull-down menu to display the contents output to the console.
- If “LOG: unexpected EOF on client connection” is displayed after “login” in the login screen, press [Enter] key.

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(10) Make sure that Figure B.1.4-12 or Figure B.1.4-13 is displayed. If not displayed, which means either OS is under boot processing / under suspension, or OS has suspended.
If Figure B.1.4-12 has been displayed, go to step (10-1).
If Figure B.1.4-13 has been displayed, go to step (10-2).

(10-1) Press [Enter] key without entering anything in the console window.
Make sure that the same prompt message has been output on the bottom of the login prompt window shown in Figure B.1.4-12.
If the same prompt message is displayed, which means that OS is booing.
If the console window has no response, either OS is hanging up or abnormally stopped.

```
File Operating System (*1)

xxxxxxxx(device-serial-number) login:
```

*1: If the OS version is 3.0.2-XX or earlier, “Hitachi File Storage Linux” is displayed.
Note that “Hitachi File Storage Linux” is not displayed if the version is 3.2.1-XX or later.

Figure B.1.4-12 Login Prompt window

(10-2) Press either [Ctrl] + [F2] key or [Alt] + [F2] key (*) and confirm that the widow has been switched to the login prompt window.
If the window is switched, OS is booting.
If the window is not switched, either OS is hanging up or abnormally stopped.

*: Note that the remote console has the restriction with [Alt] key. Therefore, execute the following three steps when using the remote console.
i Press [Alt] + [z] key and hold [Alt] key down.
ii Press either [F1] or [F2] key solely to switch the window.
iii Press [Alt] + [z] key and release [Alt] key.

```
(Hint: Press Ctrl + F2 to go to the Login screen.) (*1)

xxxxxxxx
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
```

*1: “Hint: Press Alt + F2 to go to the Login screen.” is displayed depending on the OS version.

Figure B.1.4-13 Console window 2

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B.2 BIOS Setting

B.2.1 BIOS Version Checking Procedure

NOTE:
- When requesting the system administrator for failback, failover and starting or stopping the cluster of a node, check the cluster status of the node with referring to "Maintenance Tool '2.2 Displaying the Cluster Status (clstatus)' (MNTT 02-0040)".
  After completing the operation by the system administrator, confirm the cluster status of the node with "Maintenance Tool '2.2 Displaying the Cluster Status (clstatus)' (MNTT 02-0040)", and execute the OS termination of the node. However, when the system administrator is absent, the maintenance personnel should contact to system administrator and get the permission from him/her to execute the above operation. For the execution procedure, refer to "Maintenance Tool '3.1 Failover and Node Termination to Execute the OS stop or the OS reboot' (MNTT 03-0000)".
- Open the console window of KVM or the remote console window, and then execute the procedure (1).
  For connecting KVM or the remote console, refer to 'B.1 Connection and Confirmation of OS Console.'

(1) Refer to "Maintenance Tool '2.2 Displaying the Cluster Status (clstatus)' (MNTT 02-0040)", and check whether the resource groups are running on the node where the BIOS version is to be confirmed. For the confirmation of the resource group activation, refer to "Maintenance Tool '2.2 Displaying the Cluster Status (clstatus)' (MNTT 02-0040)".
When the resource groups are running, request the system administrator to perform failover the resource groups to the other node, to be confirmed the BIOS version to the other node, and to change the "Node Status" to "INACTIVE".
For the reference place in User's Guide describing the details about stopping a node, refer to "General 'Reference Place in User's Guide for Operating Procedures Table 4 'Stopping and starting a node'' (GENE 00-0040)", and for the reference place in User's Guide describing the details about failover/failback of a resource group, refer to "General 'Reference Place in User's Guide for Operating Procedures Table 4 'Changing the execution node of a resource group'' (GENE 00-0040)".
However, when the system administrator is absent, the maintenance personnel should contact to system administrator and get the permission from him/her to execute the above operation. For the execution procedure, refer to "Maintenance Tool '3.1 Failover and Node Termination to Execute the OS stop or the OS reboot' (MNTT 03-0000)".

(2) Refer to "Installation '2.1 Procedure for Turning on and off the Power' (INST 02-0000)", and then execute the termination of the node.

(3) Start the OS of the node with referring to "Installation '2.1 Procedure for Turning on and off the Power' (INST 02-0000)".
If "Press <DEL> to enter setup" is shown on the center of the console window during the OS of the node is starting, press [Delete] key.
If [Delete] key could not be pressed, reboot the OS of the node and execute the operation from step (2) again.

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(4) The main menu window is displayed as shown in Figure B.2.1-1.
Write down the version displayed in [BIOS Version].

NOTE: Firmware update is required depending on the displayed version.

If the BIOS version check is for the OS installation, do not proceed to step (5.) Return to the caller of the BIOS version checking procedures and execute the rest of the operations.

If the BIOS version check is for motherboard replacement, select [Save & Exit] and proceed to step (5.)

In the case BMC firmware version check to be performed after the BIOS version check, proceed to 'B.2.2 BMC Firmware Version Checking Procedure (4.)'

```
Aptio Setup Utility – Copyright (C) 20xx American Megatrends, Inc.
Main   Advanced   Chipset   Server Mgmt   Boot   Security   Save & Exit

BIOS Version                xx.xx.xx
Build Date and Time         [MM/DD/YYYY HH:MM:SS]

Memory Information
Total Memory                xxxx MB

►System Information

System Language             [English]

System Date                 [Xxx MM/DD/YYYY]
System Time                 [HH:MM:SS]

Access Level                Administrator

→←:   Select Screen
↑ ↓ :  Select Item
Enter:  Select
+/-:    Change Opt.
F1:     General Help
F2:     Previous Values
F3:     Optimized Defaults
F4:     Save & Exit
ESC:    Exit

Version x.xx.xxxx.Copyright (C) 20xx American Megatrends, Inc.
```

Figure B.2.1-1 Main Menu window

NOTE: For the detailed operation method, refer to "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]".

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(5) The Save & Exit menu window is displayed as shown in Figure B.2.1-2.
Select [Discard Changes and Exit] and press [Enter] key.

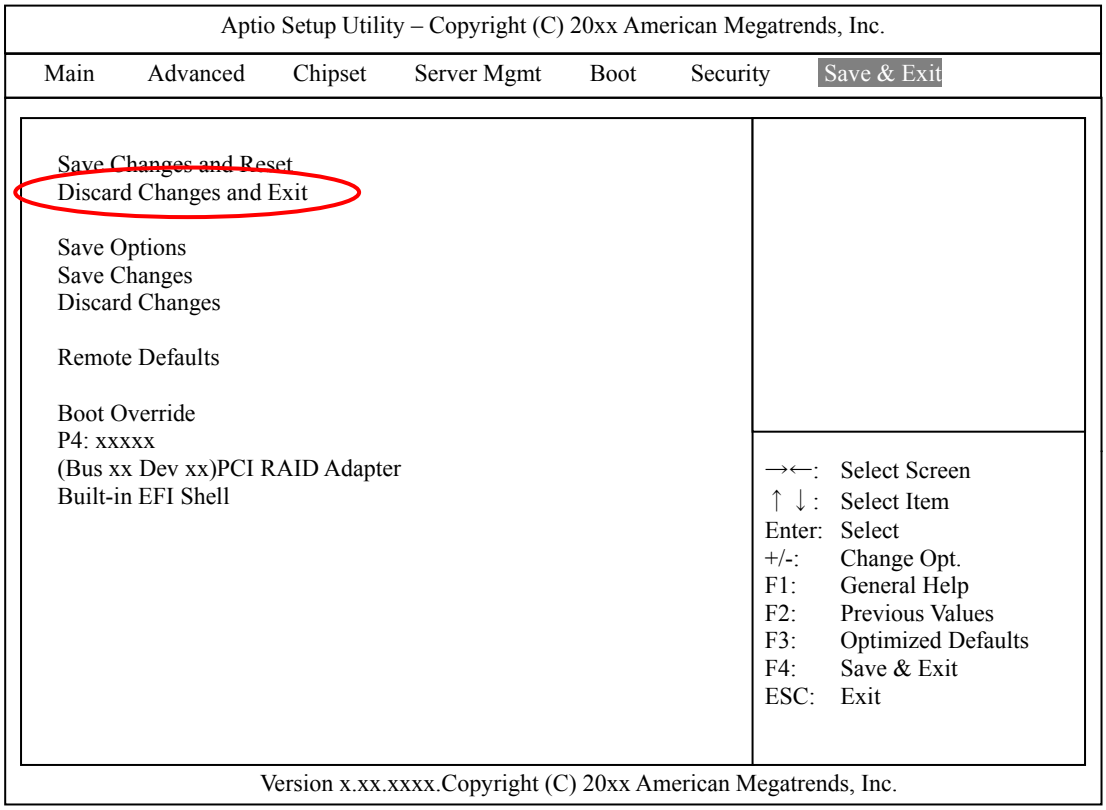

Figure B.2.1-2 Save & Exit Menu window

The Save & Exit confirmation message is displayed as shown in Figure B.2.1-3. Select [Yes] and press [Enter] key. The node will start without rebooting. Return to the caller of the BIOS version checking procedures and execute the rest of the operations.

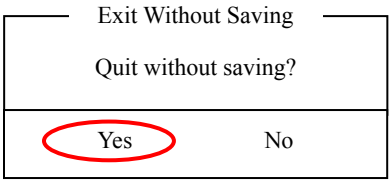

Figure B.2.1-3 Save & Exit Confirmation message

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B.2.2 BMC Firmware Version Checking Procedure

NOTE:
- When requesting the system administrator for failback, failover and starting or stopping the cluster of a node, check the cluster status of the node with referring to "Maintenance Tool '2.2 Displaying the Cluster Status (clstatus)' (MNTT 02-0040)".
  After completing the operation by the system administrator, confirm the cluster status of the node with "Maintenance Tool '2.2 Displaying the Cluster Status (clstatus)' (MNTT 02-0040)".
  However, when the system administrator is absent, the maintenance personnel should contact to system administrator and get the permission from him/her to execute the above operation.
  For the execution procedure, refer to "Maintenance Tool '3.1 Failover and Node Termination to Execute the OS stop or the OS reboot' (MNTT 03-0000)".
- Open the console window of KVM or the remote console window, and then execute the procedure (1).
  For connecting KVM or the remote console, refer to 'B.1 Connection and Confirmation of OS Console.'

(1) Refer to "Maintenance Tool '2.2 Displaying the Cluster Status (clstatus)' (MNTT 02-0040)", and check whether the resource groups are running on the node where the BMC firmware version is to be confirmed. For the confirmation of the resource group activation, refer to "Maintenance Tool '2.2 Displaying the Cluster Status (clstatus)' (MNTT 02-0040)".
When the resource groups are running, request the system administrator to perform failover the resource groups to the other node to be confirmed the BIOS version to the other node, and to change the "Node Status" to "INACTIVE".
For the reference place in User's Guide describing the details about stopping a node, refer to "General 'Reference Place in User's Guide for Operating Procedures Table 4 'Stopping and starting a node'' (GENE 00-0040)", and for the reference place in User's Guide describing the details about failover/failback of a resource group, refer to "General 'Reference Place in User's Guide for Operating Procedures Table 4 'Changing the execution node of a resource group'' (GENE 00-0040)".
However, when the system administrator is absent, the maintenance personnel should contact to system administrator and get the permission from him/her to execute the above operation. For the execution procedure, refer to "Maintenance Tool '3.1 Failover and Node Termination to Execute the OS stop or the OS reboot' (MNTT 03-0000)".

(2) Terminate the OS of the node with reference to "Installation '2.1 Procedure for Turning on and off the Power' (INST 02-0000)".

(3) Reboot the OS of the node with reference to "Installation '2.1 Procedure for Turning on and off the Power' (INST 02-0000)".
If "Press <DEL> to enter SETUP" is shown on the center of the console window during the OS of the node is starting, press [Delete] key.
If [Delete] key could not be pressed, reboot the OS of the node and execute the operation from step (2) again.

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(4) The main menu window is displayed as shown in Figure B.2.2-1.
Select [System Information], and press [Enter] key.

```
Aptio Setup Utility – Copyright (C) 20xx American Megatrends, Inc.
Main   Advanced   Chipset   Server Mgmt   Boot   Security   Save & Exit

BIOS Version                xx.xx.xx                  |
Build Date and Time         [MM/DD/YYYY HH:MM:SS]     |
                                                      |
Memory Information                                    |
Total Memory                xxxx MB                   |
                                                      |
▶System Information                                   |
                                                      |
System Language             [English]                 |
                                                      |
System Date                 [Xxx MM/DD/YYYY]          |
System Time                 [HH:MM:SS]                |  →←:   Select Screen
                                                      |  ↑ ↓:  Select Item
Access Level                Administrator             |  Enter: Select
                                                      |  +/-:  Change Opt.
                                                      |  F1:   General Help
                                                      |  F2:   Previous Values
                                                      |  F3:   Optimized Defaults
                                                      |  F4:   Save & Exit
                                                      |  ESC:  Exit
Version x.xx.xxxx.Copyright (C) 20xx American Megatrends, Inc.
```

Figure B.2.2-1 Main Menu window

NOTE: For the detailed operation methods, refer to “Maintenance Manual Hitachi Compute Rack 210HM [System Unit]”.

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(5) The System Information window is displayed as shown in Figure B.2.2-2.
Write down the version displayed in [BMC Version] and press [ESC] key.

NOTE: Firmware update is required depending on the displayed version.

```
Aptio Setup Utility – Copyright (C) 20xx American Megatrends, Inc.
Main

BMC Version                    xx-xx
SDR Version                    xxxxxxxx
MB Version                     x.x.x.xx

System Product Name            HA8000/xxxxx
System Version                 xxxxxxxxxx
System Serial Number
          xxxxxxxxxxxxxxxxxxxx

Board Product Name             xxxxxxx

LAN1 MAC Address               xx-xx-xx-xx-xx
LAN2 MAC Address               xx-xx-xx-xx-xx
BMC MAC Address                xx-xx-xx-xx-xx

Remote KVM                     xxxxxxxxxxxx
HA Monitor                     xxxxxxxxxxxx

→←:   Select Screen
↑ ↓ :  Select Item
Enter:  Select
+/-:    Change Opt.
F1:     General Help
F2:     Previous Values
F3:     Optimized Defaults
F4:     Save & Exit
ESC:    Exit

Version x.xx.xxxx.Copyright (C) 20xx American Megatrends, Inc.
```

Figure B.2.2-2 System Information window

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(6) Select [Save & Exit] to return to the main menu window. The Save & Exit menu window is displayed as shown in Figure B.2.2-3. Select [Discard Changes and Exit] and press [Enter] key.

```
Aptio Setup Utility – Copyright (C) 20xx American Megatrends, Inc.
Main   Advanced   Chipset   Server Mgmt   Boot   Security   Save & Exit

Save Changes and Reset
Discard Changes and Exit

Save Options
Save Changes
Discard Changes

Remote Defaults

Boot Override
P4: xxxxx
(Bus xx Dev xx)PCI RAID Adapter
Built-in EFI Shell

→←:   Select Screen
↑ ↓ :  Select Item
Enter:  Select
+/-:    Change Opt.
F1:     General Help
F2:     Previous Values
F3:     Optimized Defaults
F4:     Save & Exit
ESC:    Exit

Version x.xx.xxxx.Copyright (C) 20xx American Megatrends, Inc.
```

Figure B.2.2-3 Save & Exit Menu window

The Save & Exit confirmation message is displayed as shown in Figure B.2.2-4. Select [Yes] and press [Enter] key. The node will start without rebooting. Return to the caller of the BMC firmware version checking procedures and execute the rest of the operations.

```
Exit Without Saving

Quit without saving?

Yes        No
```

Figure B.2.2-4 Save & Exit Confirmation message

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B.2.3 BOOT Priority Order

NOTE: Open the console window of KVM or the remote console window, and then execute the procedure (1).
For connecting and confirming KVM or the remote console, refer to 'B.1 Connection and Confirmation of OS Console.'

(1) Stop the OS of the node with referring to "Installation '2.1 Procedure for Turning on and off the Power' (INST 02-0000)". If the Power lamp is turned off, execute the procedure step (2). When the main menu window is already displayed, proceed to step (3).

(2) Start the OS of the node with referring to "Installation '2.1 Procedure for Turning on and off the Power' (INST 02-0000)".

(3) If "Press <DEL> to enter setup" is displayed on the center of the console window while the OS of the node is starting up, press [Delete] key.
If [Delete] key cannot be pressed, execute from step (1) again.

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(4) The main menu window is displayed as shown in Figure B.2.3-1.
Select [Boot].

```
Aptio Setup Utility – Copyright (C) 20xx American Megatrends, Inc.
Main   Advanced   Chipset   Server Mgmt   Boot   Security   Save & Exit

BIOS Version                xx.xx.xx
Build Date and Time         [MM/DD/YYYY HH:MM:SS]

Memory Information
Total Memory                xxxx MB

►System Information

System Language             [English]

System Date                 [Xxx MM/DD/YYYY]
System Time                 [HH:MM:SS]

Access Level                Administrator

→←:   Select Screen
↑ ↓ :  Select Item
Enter:  Select
+/-:    Change Opt.
F1:     General Help
F2:     Previous Values
F3:     Optimized Defaults
F4:     Save & Exit
ESC:    Exit

Version x.xx.xxxx.Copyright (C) 20xx American Megatrends, Inc.
```

Figure B.2.3-1 Main Menu window

NOTE: For the detailed operation method of BIOS Setup Utility, refer to “Maintenance Manual Hitachi Compute Rack 210HM [System Unit]”.

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(5) The boot menu window is displayed as shown in Figure B.2.3-2.
Check that the items displayed under [Boot Option Priorities] are listed as the order shown in Figure B.2.3-2.
If the displayed order is different from Figure B.2.3-2, select [Boot Option #x] of which the order is different and press [Enter] to change the order.
If either or both [P4: xxxxxx ...] (enable DVD-ROM drive) and [(Bus xx Dev xx)PCI ...] (enable Disk boot) are not displayed as options when you press [Boot Option #x], they are disabled. Enable them by referring to step (a) Enable DVD-ROM drive and step (b) Enable disk boot, and then change the display order of [Boot Option #x.]

NOTE: When entering characters in the BIOS setup utility window, the keyboard layout is recognized as the 101 series Keyboard (QWERTY based layout).

```
Aptio Setup Utility – Copyright (C) 20xx American Megatrends, Inc.
Main   Advanced   Chipset   Server Mgmt   Boot   Security   Save & Exit

Boot Configuration
Setup Prompt Timeout          1
Boot Numlock State            [On]

Quiet Boot                    [Disabled]

Boot Option Priorities
Boot Option #1                [P4: xxxxxx   ...]
Boot Option #2                [xxxxxxxxxxxxxxxxx   ...]
Boot Option #3                [Built-in EFI Shell]

CD\DVD ROM Drive BBS Priorities
Hard Drive BBS Priorities

→←:   Select Screen
↑ ↓ :  Select Item
Enter:  Select
+/-:    Change Opt.
F1:     General Help
F2:     Previous Values
F3:     Optimized Defaults
F4:     Save & Exit
ESC:    Exit

Version x.xx.xxxx.Copyright (C) 20xx American Megatrends, Inc.
```

Figure B.2.3-2 Boot Menu window

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(a) Enable DVD-ROM drive
Select [CD/DVD ROM Drive BBS Priorities] and press [Enter] key. The DVD-ROM drive boot setting window is displayed as shown in Figure B.2.3-4.

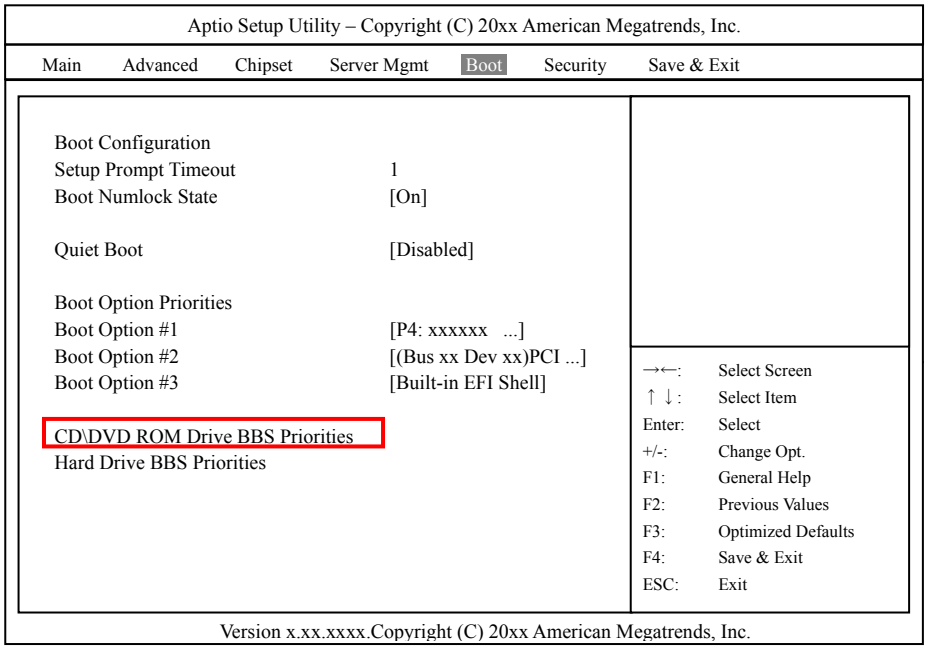

Figure B.2.3-3 Boot Menu window 2

Select [Boot Option #1] and press [Enter] key.

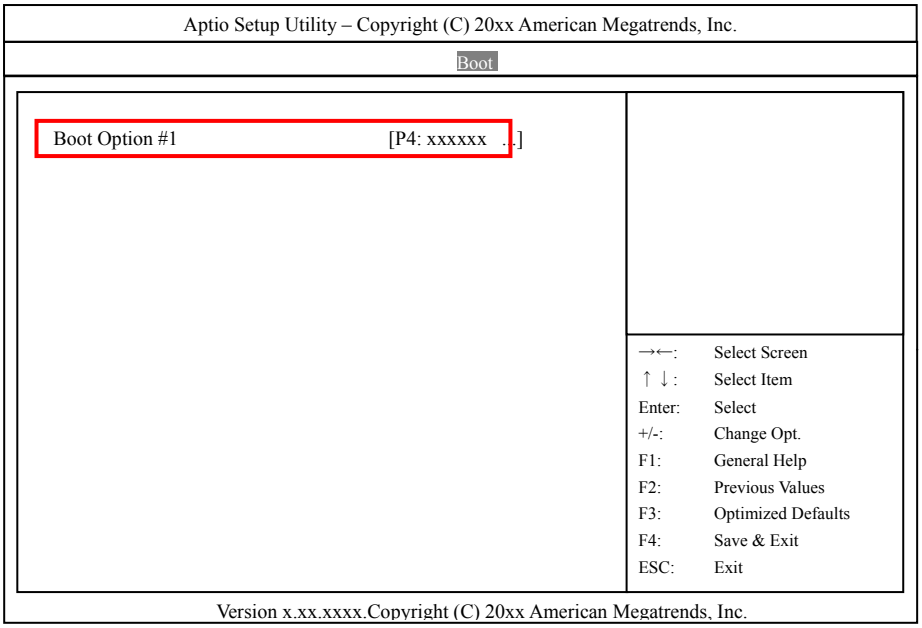

Figure B.2.3-4 DVD-ROM Drive Boot Setting window

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A window as shown in Figure B.2.3-5 is displayed. Select [P4:xxxxxx ...], press [Enter] key and then press [ESC] key to return to the boot menu window.

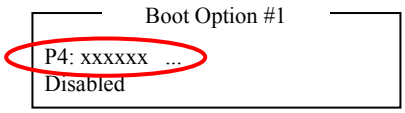

Figure B.2.3-5 Boot Option Selecting window 1

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(b) Enable disk boot
Select [Hard Drive BBS Priorities] and press [Enter] key. The disk boot setting window is displayed as shown in Figure B.2.3-7.

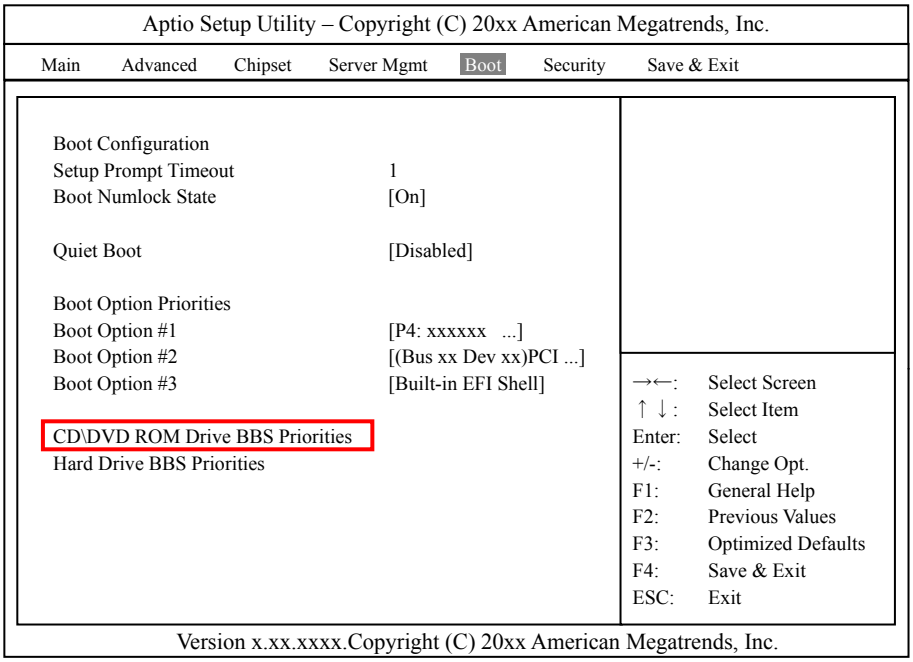

Figure B.2.3-6 Boot Menu window 3

Select [Boot Option #1] and press [Enter] key.

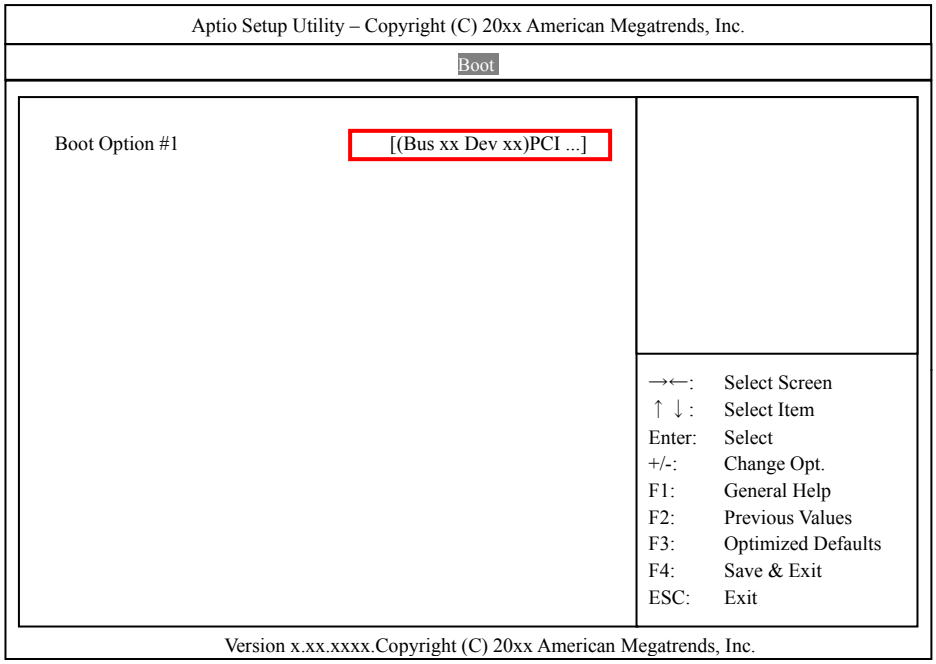

Figure B.2.3-7 Disk Boot Setting window

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A window as shown in Figure B.2.3-8 is displayed. Select [(Bus xx Dev xx)PCI ...], press [Enter] key and then press [ESC] key to return to the boot menu window.

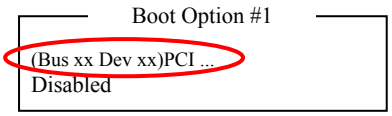

Figure B.2.3-8 Boot Option Selecting window 2

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(6) Select [Save & Exit] in the boot menu window as shown in Figure B.2.3-2.
The Save & Exit menu window is displayed as shown in Figure B.2.3-9.

```
Aptio Setup Utility – Copyright(C) 20xx American Megatrends, Inc.
Main   Advanced   Chipset   Server Mgmt   Boot   Security   Save & Exit

Save Changes and Reset
Discard Changes and Exit

Save Options
Save Changes
Discard Changes

Restore Defaults

Boot Override
P4: DV-28S-x
Built-in EFI Shell
(BUS xx Dev xx)PCI RAID Adapter

→←:     Select Screen
↑ ↓ :   Select Item
Enter :  Select
+/- :   Change Opt.
F1:     General Help
F2:     Previous Values
F3:     Optimized Defaults
F4:     Save & Exit
ESC:    Exit

Version x.xx.xxxx. Copyright(C) 20xx American Megatrends, Inc.
```

Figure B.2.3-9 Save & Exit Menu window

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(7) The procedure differs whether the setting was changed in step (5) or not.

(a) If the setting was changed in step (5), select [Save Changes and Reset] and press [Enter] key. The Save & Exit confirmation message 1 is displayed as shown in Figure B.2.3-10.
Select [Yes] and press [Enter] key to reboot the node.

(b) If the setting was not changed in step (5), select [Discard Changes and Exit] and press [Enter] key. The Save & Exit confirmation message 2 is displayed as shown in Figure B.2.3-11.
Select [Yes] and press [Enter] key, and the node will start without rebooting.

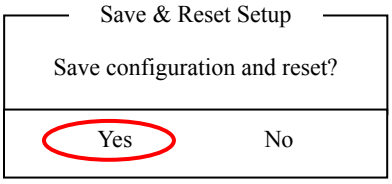
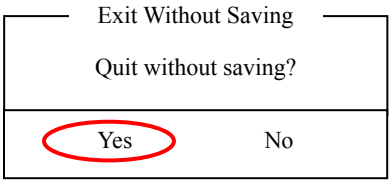


Figure B.2.3-10 Save & Exit Confirmation message 1



図B.2.3-11 Save & Exit Confirmation message 2

(8) Return to the caller of the BOOT priority order and execute the rest of the operations.

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B.2.4 Set the Time in BIOS

Set the time in BIOS from the main menu window.

To obtain the time to enter, it is required to display "Set Up 'Figure 9.1-7 "Date and Time" window 4' (SETUP 09-0030)" or run the timeget-u command on the other side node in advance.

NOTE: The timeget-u command can be run only when the mother board is replaced.

(1) Start the node. When "Press <DEL> to enter setup" is displayed on the center of the console window, press [Delete] key.
If [Delete] key cannot be pressed, reboot the node and then execute from step (1) again.
When the main menu window is already displayed, proceed to step (2).

(2) Select [System Time] from the Figure B.2.4-1 Main Menu Window, and then manually enter the UTC time that is obtained from/by either of the following:
The difference between the entered time and the obtained UTC time must be within 10 seconds.
- "Set Up 'Figure 9.1-7 "Date and Time" window 4' (SETUP 09-0030)"
- Running the timeget-u command on the other side node
  Refer to "Maintenance Tool '2.42 Acquisition of Time/Time Zone (timeget)' (MNTT 02-2430)" for details.

(3) Select [System Date] from the Figure B.2.4-1 Main Menu Window, and then manually enter the UTC date that is obtained by the same procedure as the step (2) above.

(4) Select [Save & Exit] in the main menu window as shown in Figure B.2.4-1.

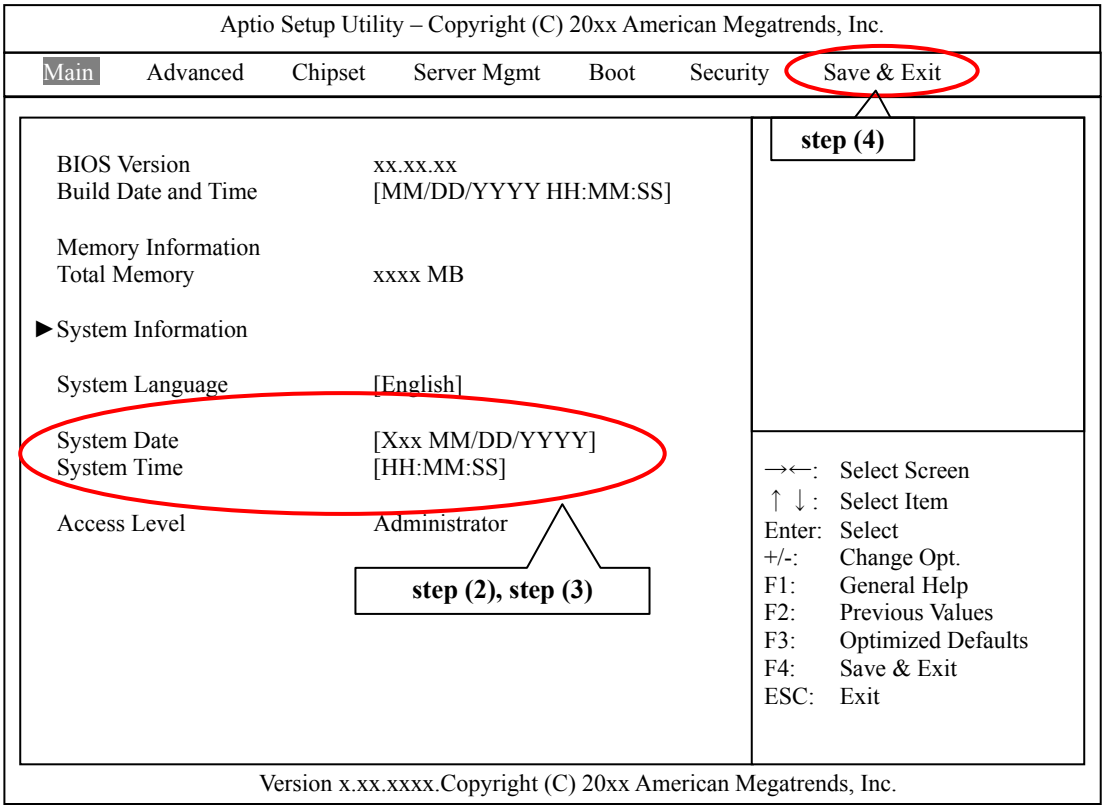

Figure B.2.4-1 Main Menu window

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(5) The Save & Exit menu window is displayed as shown in Figure B.2.4-2.
Select [Save Changes and Reset] and press [Enter] key. The Save & Exit confirmation message is displayed as shown in Figure B.2.4-3. Select [Yes] and press [Enter] key to reboot the node.

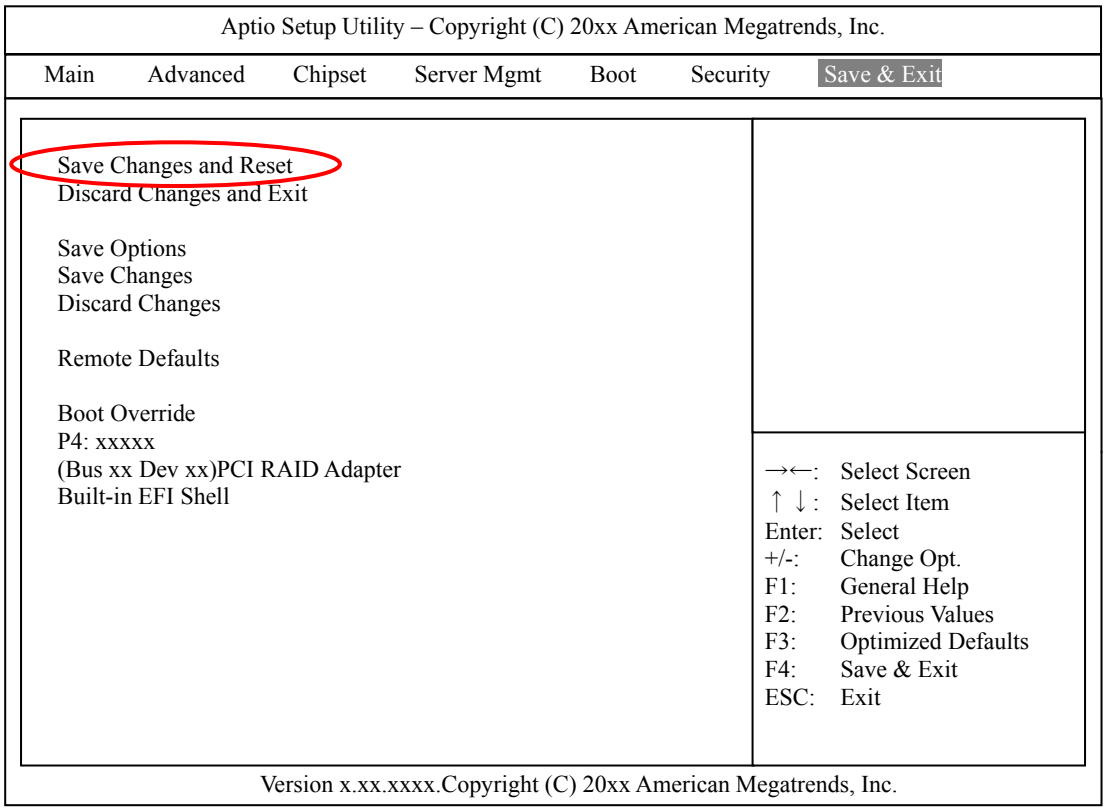

Figure B.2.4-2 Exit Menu window

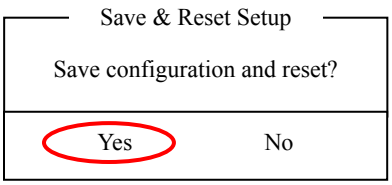

Figure B.2.4-3 Save & Exit Confirmation message

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B.2.5 BMC Setting Procedure

The setting procedure of BMC is unnecessary for the model: CR210HM.

Return to the caller of the BMC setting procedures and execute the rest of the operations.

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B.2.6 RAID Controller Setting

B.2.6.1 Virtual disk setting confirmation

The setting confirmation procedure of RAID controller is unnecessary for the model: CR210HM.

Return to the caller of RAID controller setting confirmation procedures and execute the rest of the operations.

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B.2.6.2 Virtual disk setting procedure

The setting procedure of RAID controller is unnecessary for the model: CR210HM.

Return to the caller of RAID controller setting procedures and execute the rest of the operations.

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B.2.7 Confirmation of CPU Virtualization Support Mechanism

Verify the CPU virtualization support mechanism from the main menu window.

(a) Terminate the OS of the node with reference to "Installation '2.1 Procedure for Turning on and off the Power' (INST 02-0000)". If the node is stopped already, proceed to step (b).

(b) Reboot the OS of the node with reference to "Installation '2.1 Procedure for Turning on and off the Power' (INST 02-0000)", and if "Press <DEL> to enter setup" is displayed on the center of the console window while the OS of the node is starting, press [Delete] key.
If [Delete] key could not be pressed, reboot the OS of the node and execute the operation from step (b) again.

(c) The Main menu window is displayed as shown in Figure B.2.7-1. Select [Advanced.]

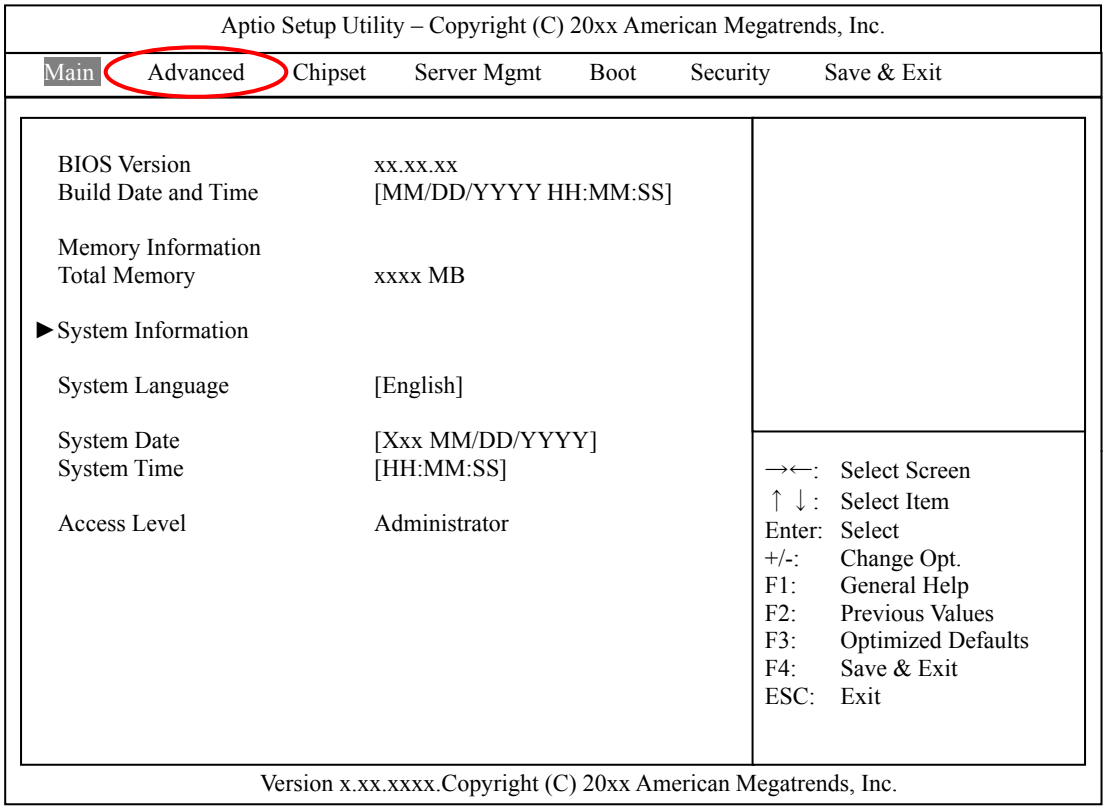

Figure B.2.7-1 Main Menu window

NOTE: For the details about the operation method of BIOS Setup Utility, refer to "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]".

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(d) The advanced menu window is displayed as shown in Figure B.2.7-2. Select [CPU Configuration] and press [Enter] key.

```
Aptio Setup Utility – Copyright (C) 20xx American Megatrends, Inc.
Main   Advanced   Chipset   Server Mgmt   Boot   Security   Save & Exit

  LAN1 PXE OpROM                [Disabled]
  LAN2 PXE OpROM                [Disabled]
► PCI Subsystem settings
► Trusted Computing
► WHEA Configuration
► CPU Configuration
► Runtime Error Logging
► SATA Configuration
► Intel TXT(LT-SX) Configuration
► USB Configuration
► Super IO Configuration
► Serial Port Console Redirection

→←:   Select Screen
↑ ↓ :  Select Item
Enter:  Select
+/-:    Change Opt.
F1:     General Help
F2:     Previous Values
F3:     Optimized Defaults
F4:     Save & Exit
ESC:    Exit

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```

Figure B.2.7-2 Advanced Menu window

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(e) The CPU advanced function setting sub menu window is displayed as shown in Figure B.2.7-3. Check that [Disabled] is displayed as [Hyper-threading] and [Enabled] is displayed as [Intel Virtualization Technology.]
When [Disabled] is displayed as [Hyper-threading] and [Enabled] is displayed as [Intel Virtualization Technology], press [ESC] key and proceed to step (f.)
When [Enabled] is displayed as [Hyper-threading], select [Hyper-threading] and change it to [Disabled], and when [Disabled] is displayed as [Intel Virtualization Technology], select [Intel Virtualization Technology] and change it to [Enabled.] After that, press [ESC] key and proceed to step (f.)

NOTE: Hyper-threading is not displayed if CR210HM is equipped with the CPU that does not support Hyper Threading. Check only Intel Virtualization Technology.

```
Aptio Setup Utility – Copyright (C) 20xx American Megatrends, Inc.
Main   Advanced   Chipset   Server Mgmt   Boot   Security   Save & Exit

CPU Configuration

►Socket 1 CPU Information
 Socket 2 CPU Information                Not Present

 Hyper-threading                         [Disabled]
 Active Processor Cores                  [All]
 Execute Disable Bit                     [Enabled]
 Hardware Prefetcher                     [Enabled]
 Adjacent Cache Line Prefetch            [Enabled]
 DCU Streamer Prefetch                   [Enabled]
 DCU IP Prefetch                         [Enabled]
 Intel Virtualization Technology         [Enabled]
 Discrete MTRR Allocation                [Enabled]
►CPU Power Management Configuration

                                         →←:  Select Screen
                                         ↑ ↓:  Select Item
                                         Enter:  Select
                                         +/-:  Change Opt.
                                         F1:  General Help
                                         F2:  Previous Values
                                         F3:  Optimized Defaults
                                         F4:  Save & Exit
                                         ESC:  Exit

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```

Figure B.2.7-3 CPU Advanced Function Setting Sub Menu window

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(f) The advanced menu window is displayed as shown in Figure B.2.7-4.
Select [Save & Exit.]

```
Aptio Setup Utility – Copyright(C) 20xx American Megatrends, Inc.
Main   Advanced   Chipset   Server Mgmt   Boot   Security   Save & Exit

  LAN1 PXE OpROM                [Disabled]
  LAN2 PXE OpROM                [Disabled]
► PCI Subsystem settings
► Trusted Computing
► WHEA Configuration
► CPU Configuration
► Runtime Error Logging
► SATA Configuration
► Intel TXT(LT-SX) Configuration
► USB Configuration
► Super IO Configuration
► Serial Port Console Redirection

→←:      Select Screen
↑ ↓ :    Select Item
Enter :  Select
+/- :    Change Opt.
F1:      General Help
F2:      Previous Values
F3:      Optimized Defaults
F4:      Save & Exit
ESC:     Exit

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```

Figure B.2.7-4 Advanced Menu window

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(g) The Save & Exit menu window is displayed as shown in Figure B.2.7-5.
The procedure differs whether the setting was changed in step (e) or not.
If the setting was changed in step (e), select [Save Changes and Reset] and press [Enter] key.
The Save & Exit confirmation message 1 is displayed as shown in Figure B.2.7-6. Select [Yes] and press [Enter] key to reboot the node.
If the setting was not changed in step (e), select [Discard Changes and Exit] and press [Enter] key.
The Save & Exit confirmation message 2 is displayed as shown in Figure B.2.7-7.
Select [Yes] and press [Enter] key. The node will start without rebooting.

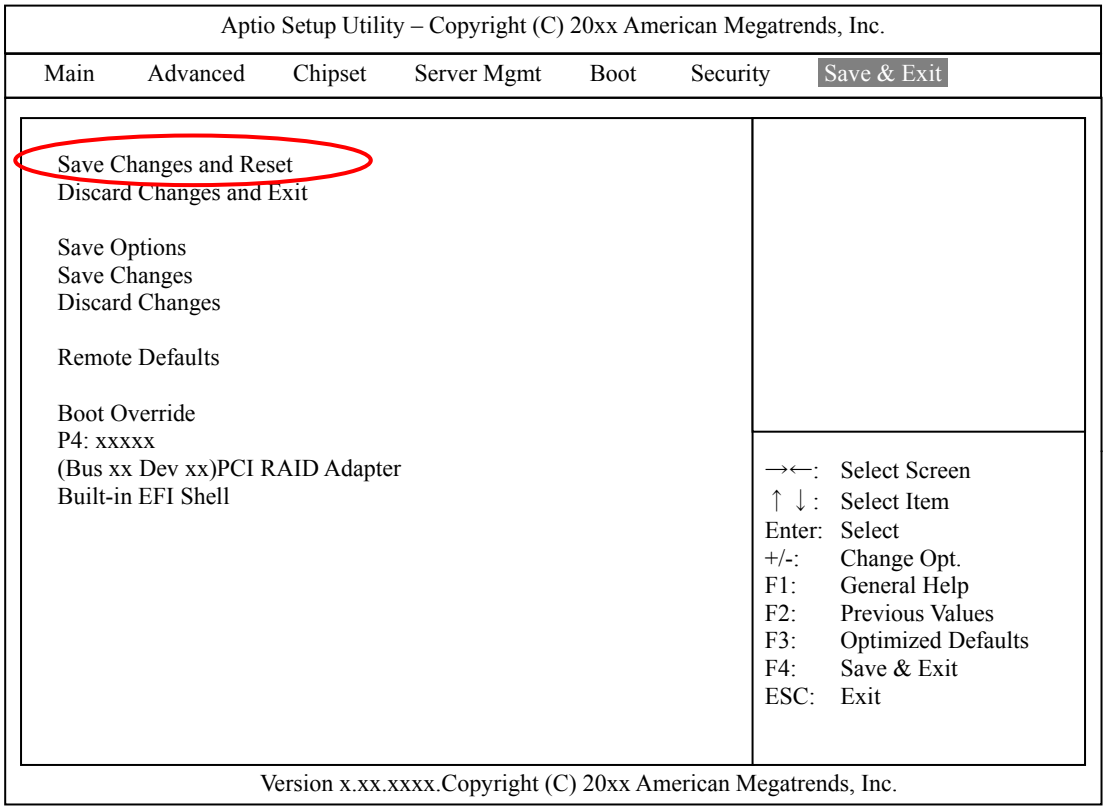

Figure B.2.7-5 Save & Exit Menu window

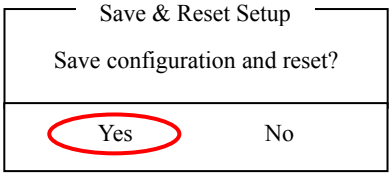

Figure B.2.7-6 Save & Exit Confirmation message 1

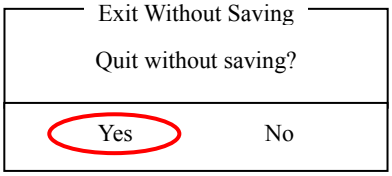

Figure B.2.7-7 Save & Exit Confirmation message 2

(h) Return to the caller and execute the rest of the operations.

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B.2.8 Virtual Drive Consistency Checking Procedure

The virtual drive consistency checking procedure is not necessary when the target model is CR210HM.

Return to the caller of the virtual drive consistency checking procedure and execute the rest of the operations.

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B.2.9 Other Setting/Confirmation Items

(1) Confirmation of the setting of Hyper-threading
It is confirmed that the setting of Hyper-threading is [Disabled].

NOTE: If [Hyper-threading] is not displayed in the CPU advanced function setting sub menu window in 'B.2.7 Confirmation of CPU Virtualization Support Mechanism', confirmation of the setting of Hyper-threading is not necessary.

(a) Log in to the node to be maintained from the maintenance PC.
Refer to "Maintenance Tool '1.3 Procedures for Operating Commands' (MNTT 01-0200)" for Login.

(b) Execute "mpstat -P ALL". The execution example is shown in Figure B.2.9-1.
Confirm that the values in the CPU row are "all" or the numbers from 0 to 5.

If there is a number greater than or equal to 6 in the CPU row, Hyper-threading must be set to Enabled. Execute "B.2.7 Confirmation of CPU Virtualization Support Mechanism" again to set Hyper-threading to [Disabled].

```
$ mpstat -P ALL
Linux 2.6.30.1-HFSL (DXXXXXXXXXX)      09/08/2014      _x86_64_

08:05:50 AM  CPU   %user   %nice   %sys %iowait    %irq  %soft  %steal   %idle    intr/s
08:05:50 AM  all    0.55    0.00   0.68    0.28    0.03   0.05    0.00   98.42   1392.53
08:05:50 AM    0    0.61    0.00   1.06    0.64    0.07   0.14    0.00   97.48    309.13
08:05:50 AM    1    0.68    0.00   1.17    0.91    0.10   0.11    0.00   97.02    213.70
08:05:50 AM    2    0.57    0.00   0.53    0.04    0.00   0.01    0.00   98.85      5.00
08:05:50 AM    3    0.42    0.00   0.36    0.02    0.00   0.01    0.00   99.19      0.00
08:05:50 AM    4    0.61    0.00   0.55    0.02    0.00   0.00    0.00   98.82      0.00
08:05:50 AM    5    0.43    0.00   0.37    0.02    0.00   0.01    0.00   99.18      0.00
```

Figure B.2.9-1 Execution example of the command

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B.3 Maintenance CLI

B.3.1 Displaying the Hardware Status (hwstatus)

The hwstatus command displays the hardware status of the node.

B.3.1.1 Command line

The command line of the hwstatus command can use the following options.

hwstatus [-h]

Table B.3.1.1-1 shows the description of the options.

Table B.3.1.1-1 Command Options

No.	Option	Description	Remarks
1	-h	Displays the format of the command.	—

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B.3.1.2 Output format

The output format at the time of hwstatus command execution is shown in Figure B.3.1.2-1, and the contents of the output format are shown in Table B.3.1.2-1.

```
Output format of hwstatus

Model Information                                                                   1
 HITACHI      Compute Rack 210H
SerialNumber Information                                                            2
 323GQA210HM-TNNN3N000000009
Fan Information                                                                     3
 0            ok                    -
 1            failed                -
 (Repeat for the number of cooling fan unit)
Temperature Information                                                             4
 0            ok                    reading:33_(+/-_1)_degrees_C
 (Repeat for the number of temperature sensor.)
PowerSupply Information                                                             5
 0            ok                    -
 1            failed                -
Memory Information                                                                  6
 0            installed             locator: CPUX_DIMMXX,size:YYYY_MB
 1            not_installed         locator: CPUX_DIMMXX,size:-
 (Repeat for the number of DIMMs)
MemoryTotal Information                                                             7
 0            -                     size: 5.5  GB(6.0  GB)
InternalHDD Information                                                             8
 0            ok                    size:XXX.XXX_GB,raid_level:RAIDX,media_error:0,predictive_failure:0
 1            failed                size:XXX.XXX_GB,raid_level:RAIDX,media_error:0,predictive_failure:0
InternalRAIDBattery Information                                                     9
 -            -                     -
BMC Information                                                                     10
 status       ok
 connection   ok
Network Interface                                                                   11
 mng0         up                    linkspeed: XXXXBase,mediatype:Copper,Management port
 hb0          down                  linkspeed: XXXXBase,mediatype:Copper,Heartbeat port
 (Repeat for the number of port names)
FC Port Information                                                                 12
 fcXXXX       up       wwpn: xxxxxxxxxxxxxxxx, linkspeed:8_Gbit
 fcXXXX       up       wwpn: xxxxxxxxxxxxxxxx, linkspeed:8_Gbit
 (Repeat for the number of port names)
```

Figure B.3.1.2-1 hwstatus Output Format

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Table B.3.1.2-1 Contents of Output Format (1/3)

No.	Item	Description	Remarks
1	Model Information		
	HITACHI	Displays the name of manufacturer.	HITACHI
	Compute Rack 210H	Displays the name of a product. The product name is shown after the manufacturer.	Compute Rack 210H
2	Serial Number Information		
	XXXXXXXXXX	Displays the serial number of a model.	—
3	Fan Information		
	0, 1, •••	Displays the sequential serial numbers of cooling fan unit.	0 to 15
	ok, failed	Displays the availability of failures of cooling fan unit. (*1)	ok : Normal status failed : Abnormal status Usually everything is “ok”.
	-	Displays the vendor's unique information acquired by the hardware.	Usually displays a hyphen.
4	Temperature Information		
	0, 1, •••	Displays the sequential system thermometer of serial numbers.	0 to 6
	ok, failed	Displays the status of the system temperature. (*1)	ok : Normal status failed : Abnormal status Usually everything is “ok”.
	reading: 33_(+/-_1)_degrees_C	Displays the vendor’s unique information acquired by the hardware.	The format depends on the vendor. (*2)
5	Power Supply Information		
	0, 1	Displays the sequential serial numbers of the power supply unit.	0 to 1
	ok, failed, not_installed	Displays the availability of power supply unit failures. (*1)	ok : Normal status failed : Abnormal status not_installed : Not installed
	-	Displays the vendor’s unique information acquired by the hardware.	Usually displays a hyphen.
6	Memory Information		
	0, 1, •••	Displays the sequential serial numbers of Memories.	0 to 23
	installed, not_installed	Displays the information of DIMM. (*1)	installed : Installed not_installed : Not installed
	locator: CPUX_DIMMXX, size:YYYY_MB	Displays the vendor’s unique information acquired by the hardware.	The format depends on the vendor. (*2)
7	MemoryTotal Information		
	0	Displays the total number of Memory in numerical order.	0
	size: xx_GB(yy_GB)	Displays the vendor’s unique information acquired by the hardware.	Displays the total sum of Memory in GB. By the configuration of the system, the total number of memory may display smaller than the installed memory that is displayed in the parentheses. (*2)

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Table B.3.1.2-1 Contents of Output Format (2/3)

No.	Item	Description	Remarks
8	Internal HDD Information		
	0, 1, ...	Displays the sequential serial numbers of Internal HDD.	0 to 1
	ok, rebuild, failed, not_supported	Displays the embedded HDD status. (*1)	ok : Normal status rebuild : RAID is being rebuilt failed : A hardware failure was detected in the disk. Some disks have failures or do not exist. not_supported : information cannot be get due to no installation of MegaCLI.
	size:XXX.XXX_GB, raid_level:RAIDX, media_error:X,predictive_failure:X	Displays the vendor's unique information acquired by the hardware.	The format is vendor dependent. (*2) media_error:X is "1" in the case that the media error count has exceeded the threshold value. And X is "0" in the case that the media error count has been under the threshold value. A hyphen is displayed in case of an information acquisition failure. predictive_failure:X is "1" in the case that S.M.A.R.T. warnings has exceeded the threshold. And X is "0" in the case that S.M.A.R.T. warnings has been under the threshold. A hyphen is displayed in case of an information acquisition failure. (*10)
9	InternalRAIDBattery Information		
	-	Displays the "-".	—
	-	Displays the "-".	—
	-	Displays the "-".	—
10	BMC Information		
	status ok, status Unknown!	Displays this side node BMC status.	ok : Normal status Unknown! : Information acquisition of BMC fails
	connection ok, connection failed, connection none	Displays the other side node BMC connection status.	(*6) ok : Normal status failed : Communication with BMC of the other side node fails. none : Cluster is not built

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Table B.3.1.2-1 Contents of Output Format (3/3)

No.	Item	Description	Remarks
11	Network Interface		
	mng0, hb0, pm0, pm1, ethX, •••	Displays the port name. (*3) (*4)	mng0 : Management port hb0 : Heartbeat port (*6) (*8) pm0 : Maintenance port pm1 : Reset port ethX : Data port (1GbE) xgbeX : Data port (10GbE) * X indicates an integer more than or equal to 0. Example: eth1
	up, down	Displays the port status. (*3) (*4)	up : LinkUp down : LinkDown * The port not connecting the cable displays “down”. (*5)
	linkspeed: XXXXBase, linkspeed: Unknown!	Displays the link speed. (*4)	10Base : 10Mbps 100Base : 100Mbps 1000Base : 1Gbps 10000Base : 10Gbps Unknown! : Link speed is unknown
	mediatype:Copper	Displays the media type. (*3) (*4)	Copper : Copper wire
	Management port, Heartbeat port, Private maintenance port	Displays the use. (*4)	Management port : In case the port name is “mng0” Heartbeat port : In case the port name is “hb0” Private Maintenance port : In case the port name is “pm0, pm1” * The use is not displayed for other ports.
12	FC Port Information (*9)		
	fcXXXX, …	Displays the Fibre Channel port name in ascending order. (*1)	X represents an integer greater than or equal to 0. (Hexadecimal)
	up, down	Displays the port status. (*1)	up : LinkUp down : LinkDown
	wwpn: xxxxxxxxxxxxxxxx	Displays the host port WWN. (*1)	—
	linkspeed:8_Gbit	Displays the link speed. (*1)	1_Gbit : 1Gbps 2_Gblt : 2Gbps 4_Gbit : 4Gbps 8_Gbit : 8Gbps 10_Gbit : 10Gbps 16_Gbit : 16Gbps Unknown! : Displayed during LinkDown or for link speeds that are not supported

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*1: In case of an information acquisition failure, a hyphen is displayed. Note that, even in case of an information acquisition failure, the information already acquired is displayed.
*2: When the vendor's unique information does not exist, a hyphen is displayed.
*3: When the acquisition of the statuses of all pots failed, the Network Interface information is displayed in only one row. In this case, a hyphen is displayed for the port name, the port status, and the media type.
*4: When the acquisition of the status in units of ports fails, the information of the port which failed the acquisition is not displayed.
*5: Unused (unset) data port also displays "down". In this case, check if "(Not used)" is displayed just after the name of interface, by using iflist -v command. To execute this operation, refer to "Maintenance Tool '2.4 Displaying the Network Status (iflist)' (MNTT 02-0200)".
*7: The number differs depending on the configuration.
*8: In case of checking the network setting of hb0, specify the "-v" option for the clstatus command and execute. For details, refer to "Maintenance Tool '2.2 Displaying the Cluster Status (clstatus)' (MNTT 02-0040)".
*9: Nothing is shown on the OS version 5.1.0-XX or earlier. For checking the OS version, refer to "Maintenance Tool '2.34 Displaying the Version of the OS (versionlist)' (MNTT 02-2060)".
*10: "media_error" and "predictive_failure" is displayed on the OS version 5.2.0-XX or later. For checking the OS version, refer to "Maintenance Tool '2.34 Displaying the Version of the OS (versionlist)' (MNTT 02-2060)".

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B.3.1.3 Execution procedure

This subsection describes the procedure for executing the hwstatus command.

(1) Log in to the execution node via ssh from the maintenance PC usually. For the login method, refer to "Maintenance Tool '1.3 Procedures for Operating Commands' (MNTT 01-0200)".

(2) Execute the hwstatus command by each node. Figure B.3.1.3-1 shows display examples at the time of hwstatus execution.
If the hwstatus command terminated abnormally, the hardware status is not displayed, and the message ID is displayed. In this case, refer to 'B.3.1.4 Command termination messages and action to be taken', and take actions.

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```
$ sudo hwstatus
Model Information
 HITACHI      Compute Rack 210H
SerialNumber Information
 323GQA210HM-TNNN3N000000009
Fan Information
 0            ok            -
 1            ok            -
 2            ok            -
 3            ok            -
 4            ok            -
 8            ok            -
 9            ok            -
 10           ok            -
 11           ok            -
 12           ok            -
Temperature Information
 0            ok            reading:45_(+/-_0)_degrees_C
 1            ok            reading:48_(+/-_0)_degrees_C
 2            ok            reading:43_(+/-_0)_degrees_C
 3            ok            reading:54_(+/-_0)_degrees_C
 4            ok            reading:45_(+/-_0)_degrees_C
 5            ok            reading:46_(+/-_0)_degrees_C
 6            ok            reading:34_(+/-_0)_degrees_C
PowerSupply Information
 0            ok            -
 1            ok            -
Memory Information
 0            installed     locator:CPU1_DIMM1,size:4096_MB
 1            not_installed locator:CPU1_DIMM5,size:-
 2            not_installed locator:CPU1_DIMM9,size:-
 3            installed     locator:CPU1_DIMM2,size:4096_MB
 4            not_installed locator:CPU1_DIMM6,size:-
 5            not_installed locator:CPU1_DIMM10,size:-
 6            installed     locator:CPU1_DIMM3,size:4096_MB
 7            not_installed locator:CPU1_DIMM7,size:-
 8            not_installed locator:CPU1_DIMM11,size:-
 9            installed     locator:CPU1_DIMM4,size:4096_MB
 10           not_installed locator:CPU1_DIMM8,size:-
 11           not_installed locator:CPU1_DIMM12,size:-
 12           not_installed locator:CPU2_DIMM1,size:-
 13           not_installed locator:CPU2_DIMM5,size:-
 14           not_installed locator:CPU2_DIMM9,size:-
 15           not_installed locator:CPU2_DIMM2,size:-
 16           not_installed locator:CPU2_DIMM6,size:-
 17           not_installed locator:CPU2_DIMM10,size:-
 18           not_installed locator:CPU2_DIMM3,size:-
 19           not_installed locator:CPU2_DIMM7,size:-
 20           not_installed locator:CPU2_DIMM11,size:-
 21           not_installed locator:CPU2_DIMM4,size:-
 22           not_installed locator:CPU2_DIMM8,size:-
 23           not_installed locator:CPU2_DIMM12,size:-
MemoryTotal Information
 0            size:15.4_GB(16.0_GB)
```

Figure B.3.1.3-1 Display Examples at the time of hwstatus Execution (1/2)

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```
InternalHDD Information
 0              ok              size:279.396_GB,raid_level:RAID1,media_error:0,predictive_failure:0
 1              ok              size:279.396_GB,raid_level:RAID1,media_error:0,predictive_failure:0
InternalRAIDBattery Information
 -              -               -
BMC Information
 status         ok
 connection     ok
Network Interface
 mng0           up              linkspeed: 1000Base,mediatype:Copper,Management port
 hb0            up              linkspeed:  100Base,mediatype:Copper,Heartbeat port
 eth0           up              linkspeed: 1000Base,mediatype:Copper
 eth1           down            linkspeed: Unknown!,mediatype:Copper
 eth2           down            linkspeed: Unknown!,mediatype:Copper
 eth3           down            linkspeed: Unknown!,mediatype:Copper
 pm0            down            linkspeed: Unknown!,mediatype:Copper,Private maintenance port
 pm1            up              linkspeed:  100Base,mediatype:Copper,Private maintenance port
FC Port Information
 fc0004         up              wwpn: 50000870005aab2c, linkspeed:8_Gbit
 fc0005         up              wwpn: 50000870005aab2e, linkspeed:8_Gbit
```

Figure B.3.1.3-1 Display Examples at the time of hwstatus Execution (2/2)

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B.3.1.4 Command termination messages and action to be taken

A message may be displayed when the hwstatus command is executed. Actions to be taken against messages are described in Table B.3.1.4-1 “Message IDs and Actions to be Taken”.

Table B.3.1.4-1 Message IDs and Actions to be Taken

No.	Message ID	Message	Description	Action
1	KAQM14131-E	A syntax error exists in the parameter (<*parameter*>).	The parameter has an error.	Specify the correct parameter, and execute it again.
2	KAQM14134-E	An error occurred in the shared processing of commands. (Error = <*error*>)	An error occurred in the common processing of the command.	Collect the OS log, and send it to the support center. To collect the OS log, refer to “Maintenance Tool ‘2.19 Collecting Logs (oslogget)’ (MNTT 02-1300)”.
3	KAQM14136-I	Usage: <*command-syntax*>	The command format is output.	Not required to be corresponding. Displayed when the –h option is specified. Also displayed continuously when KAQM14131-E is displayed.
4	KAQM14138-E	There are too many or too few parameters.	The parameter has excess or deficiency.	After confirming the format of the command, specify the correct parameter, and execute it again.
5	KAQM14150-E	An error occurred in the system.	An error occurred in the system.	Collect the OS log, and send it to the support center. To collect the OS log, refer to “Maintenance Tool ‘2.19 Collecting Logs (oslogget)’ (MNTT 02-1300)”.
6	KAQM14167-W	MegaCLI, which is required to acquire internal hard disk and battery information, is not installed.	Necessary commands to get the information of the built-in disks and batteries are not installed.	Execute again, by installing necessary commands to get the information of the built-in disks and batteries.

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CONTENTS

B.4 Setting Value when the OS is Installed

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B.4 Setting Value when the OS is Installed

The following shows the setting value that is required when installing OS.
After confirming the following table, return to the status before coming to this operation.

Table B.4-1 Setting Value when the OS is Installed

Item	Setting value
Configuration	Cluster node configuration.
User data location	This is not displayed in the cluster configuration.
RAID rebuilding necessity	This is not displayed in the cluster configuration.

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B.5 Disk Setting

B.5.1 Acquiring WWNs of Nodes

Acquire WWN of the node set in the HBA BIOS from the console of KVM, LCD, or Remote console.
In the cluster configuration, perform this operation for either node by switching the console.

For connection of KVM and LCD, refer to "Set Up '1.2 Confirmation of KVM Connection' (SETUP 01-0010)" and for connection of Remote console, refer to "Set Up '1.4 Connection Confirmation of the Remote Console' (SETUP 01-0010.)"

B.5.1.1 In the case of Emulex HBA

(1) Perform item (a) when the OS is terminated or execute (b) when the OS is started.

(a) Start the OS by referring to "Installation '2.1.1 Procedure for turning on the power' (INST 02-0000)".

(b) Restart the OS by referring to "Installation '2.1.3 Procedure for rebooting the OS' (INST 02-0100)".

(2) If the following message is displayed while the OS is in operation, press [E] key while holding down the [Alt] key or [Ctrl] key to display the Emulex Utility window.

NOTE: When using Remote console, the console window is closed by pressing the [E] key while holding down the [Alt] key. Therefore, hold down the [Ctrl] key and press the [E] key.

```
<Message>
    Press < Alt-E> or <Ctrl-E> to enter Emulex BIOS Configuration
    utility. Press< s > to skip Emulex BIOS
```

(3) Enter a list number (1 or 2) of a port where WWN to be acquired in "Enter a Selection:" as shown in Figure B.5.1.1-1, and then press [Enter] key.
If WWNs of all the installed ports have already been acquired, press [x] key and execute step (5).

NOTE:
- Figure B.5.1.1-1 shows an example of the window when one HBA is installed in only one node.
- Figure B.5.1.1-1 shows an example of the input window when the port number "1" is selected.

```
Emulex Light Pulse BIOS Utility, ZB2.01a2
Copyright (c) 1997-2007 Emulex. All rights reserved.

Emulex Adapters in the System:

1. LPe11002- M4:    PCI Bus, Device, Function (02, 00, 00)   List No. "1"
2. LPe11002- M4:    PCI Bus, Device, Function (02, 00, 01)   List No. "2"

Enter a Selection: 1

Enter <x> to Exit
```

Figure B.5.1.1-1 Emulex Utility window (example) when 1 HBA and 2 Ports are Mounted

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(4) Take a note of WWN (16-digit alphanumeric characters) displayed at “Port Name:” as shown in Figure B.5.1.1-2 in the worksheet for a memo of WWN as shown in Table B.5.1.1-1, and then press [Esc] key to return to the previous window.

```
Adapter 01:              PCI Bus, Device, Function (03, 00, 01)

LPe12002-M8-HI: Mem Base: DF980000     Firmware Version: US1.10A5
Port Name: 10000000 C9F4E21B   Node Name: 20000000 C9F4E21B
Topology: Auto Topology : Loop First (Default)
The BIOS of this Adapter is Disable


1. Configure Boot Devices
2. Configure This Adapter's Parameters



Enter a Selection:

Enter <x> to Exit        <d> to Default Values        <Esc> to Previous Menu
```

Figure B.5.1.1-2 Emulex Utility Port window (example) when 1 HBA and 2 Ports are Mounted

NOTE: Columns “List No.1” and “List No.2” in Table B.5.1.1-1 correspond to the list numbers “1” and “2” in Figure B.5.1.1-1.

Table B.5.1.1-1 Example of Writing Worksheet for Memo of WWN when the port number of Node0 is “1”

	List No.1 (*1)	List No.2 (*2)
node0	10000000 C9F4E21B	
node1		

*1: This corresponds to the port “fc0005” in ‘Figure A.2.2.2-1 Rear View of the Node (Example.)’
*2: This corresponds to the port “fc0004” in ‘Figure A.2.2.2-1 Rear View of the Node (Example.)’

(5) Perform steps (3) and (4) for the number of mounted ports.

(6) Enter “Y” at “REBOOT THE SYSTEM (Y/N);” in the message of Figure B.5.1.1-3.

```
Reboot the System to make All the Changes to Take Effect!

REBOOT THE SYSTEM (Y/N);
```

Figure B.5.1.1-3 Reboot Message

(7) When you enter “Y”, the node is automatically rebooted.

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B.5.1.2 In the case of Hitachi HBA

(1) Perform item (a) when the OS is terminated or execute (b) when the OS is started.

(a) Start the OS by referring to "Installation '2.1.1 Procedure for turning on the power' (INST 02-0000)".

(b) Restart the OS by referring to "Installation '2.1.3 Procedure for rebooting the OS' (INST 02-0100)".

(2) If the following message is displayed while the OS is in operation, press [R] key while holding down the [Ctrl] key to display the Hitachi Fibre Channel Adapter ROM BIOS window.

```
<Message>
    Hitachi Fibre Channel Adapter ROM BIOS Version XX.XX.XX.XX
    Copyright (C)HITACHI,Ltd 20XX,20XX. All rights reserved.

    Press <Ctrl-R> to Enter BIOS
```

(3) Select "SELECT HBA" in Figure B.5.1.2-1, and then press [Enter] key.

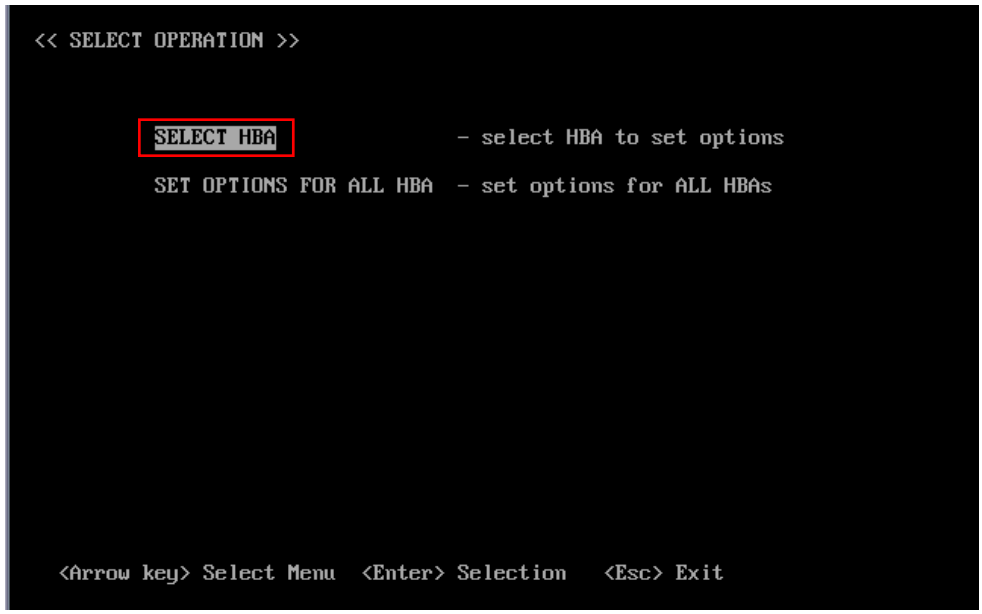

Figure B.5.1.2-1 SELECT OPERATION Window

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(4) Take a note of WWN (16-digit alphanumeric characters) displayed at “FC WORLD WIDE NAME” as shown in Figure B.5.1.2-2 in the worksheet for a memo of WWN as shown in Table B.5.1.2-1, and then press [Esc] key to return to the previous window.

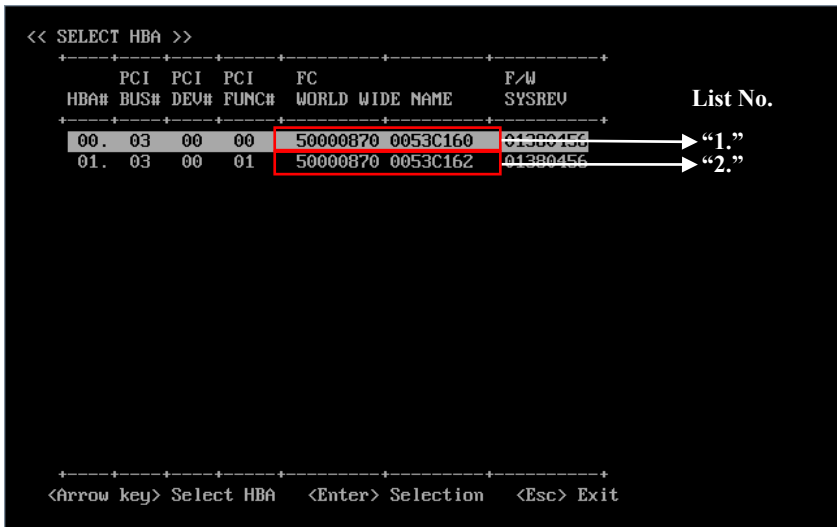

Figure B.5.1.2-2 SELECT HBA window (Example)

NOTE: Columns “List No.1” and “List No.2” in Table B.5.1.2-1 correspond to the list numbers “1” and “2” in Figure B.5.1.2-1.

Table B.5.1.2-1 Example of Writing Worksheet for Memo of WWN when the port number of Node0 is “1”

	List No.1 (*1)	List No.2 (*2)
node0	50000870 0053C160	
node1		

*1: This corresponds to the port “fc0004” in ‘Table A.2.2.2-1 Rear View of the Node (Example.)’
*2: This corresponds to the port “fc0005” in ‘Table A.2.2.2-1 Rear View of the Node (Example.)’

(5) The window as shown in Figure B.5.1.2-1 is displayed. Press [Esc] key to display the EXIT SETUP window as shown in Figure B.5.1.2-3. Select “EXIT SETUP” and press [Enter] key. The node will be rebooted.

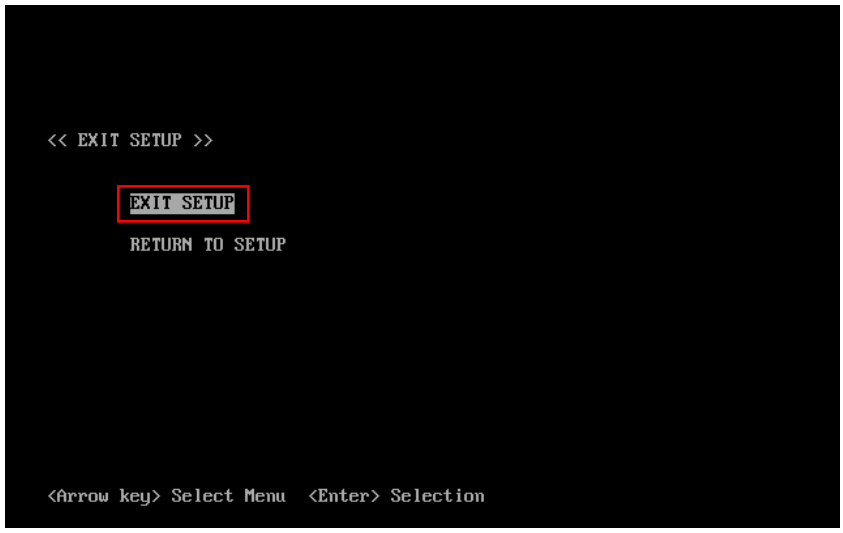

Figure B.5.1.2-3 EXIT SETUP window

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C.1 Local Initial Operations According to Maintenance Request

Before troubleshooting, this chapter describes precautions for maintenance personnel to refer to maintenance procedures in HA8000 maintenance manual partly.

Determination of a failure and parts replacement of Hitachi Data Ingestor (HDI) hardware are performed with reference to both the HDI maintenance manual and the HA8000 maintenance manual for which maintenance personnel need to do a certain amount of work in the HA8000 maintenance manual first and return to the work in the HDI maintenance manual.

Figure C.1-1 shows general flow for the maintenance personnel to refer to the proper procedures described in the two maintenance manuals while performing troubleshooting or parts replacement of HDI hardware.

The maintenance personnel must refer to and understand the flow in Figure C.1-1 before performing troubleshooting or parts replacement.

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Troubleshooting or parts replacement policy using two manuals (*)

- ✓ Start a failure determination with HDI maintenance manual.
- ✓ Determine a failure by HATP if node is down; determine a failure by SIM of the OS if node is running.
- ✓ Do not refer to the parts replacement procedure of HA8000 maintenance manual from the result of the failure determination of HA8000 maintenance manual; return to the caller of HDI maintenance manual and follow the instruction.
- ✓ If the node did not recover from the failure after part replacement, determine the failure again.

*: "Two manuals" indicates HDI maintenance manual and HA8000 maintenance manual.

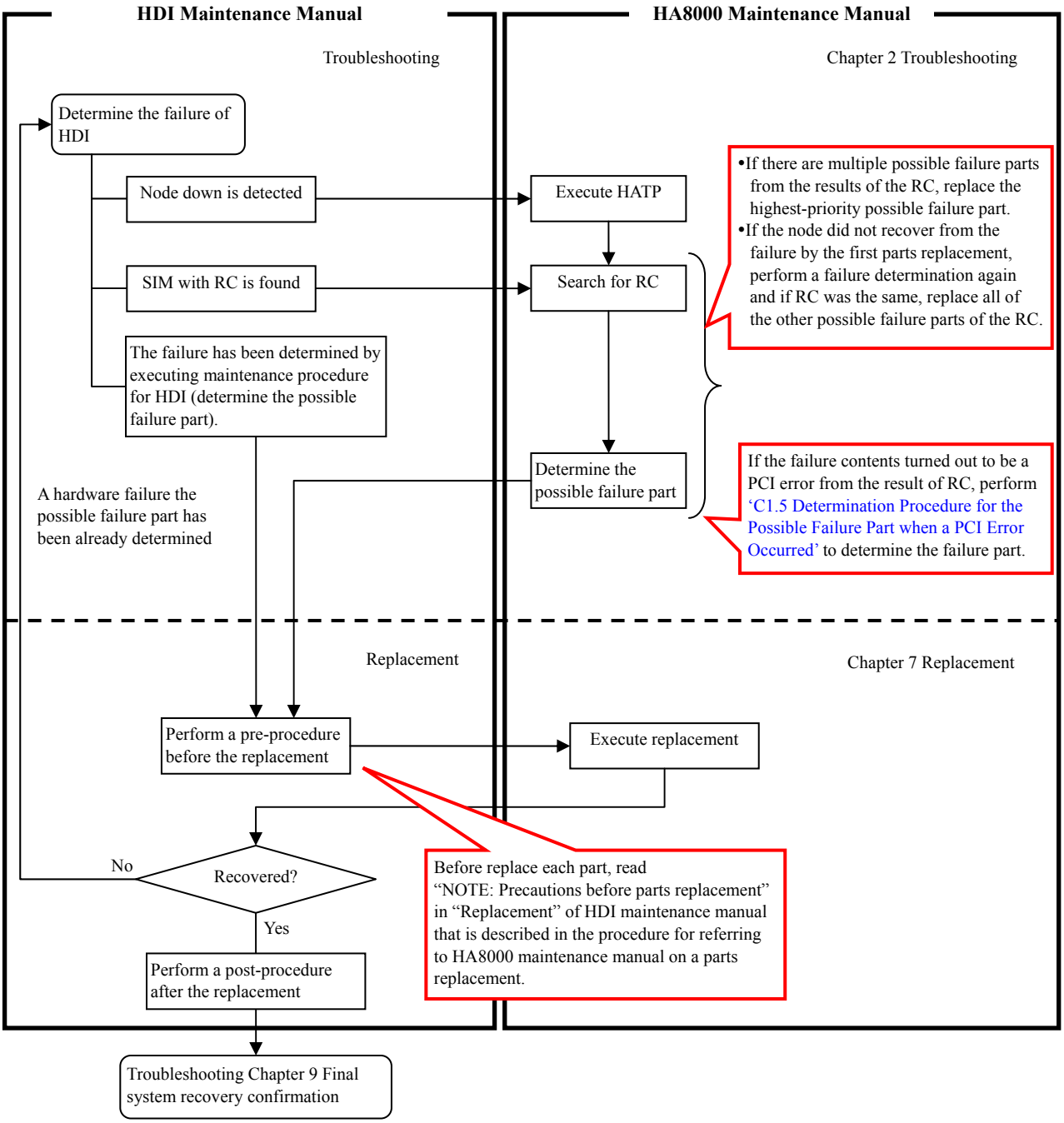

Figure C.1.1 General Flow for Referring to Procedures in Two Manuals

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C.1.1 When Detected by HiTrack

A failure detected by HiTrack is reported to the Maintenance Center of (HDS) by HiTrack. The maintenance personnel should perform the failure analysis according to the following.

(1) Receive the failure information acquired by HiTrack from the Maintenance Center of (HDS) via FTP or e-mail.

(2) Acquire TagID and SIM from the received failure information.
The acquired TagID is used in the failure analysis to specify the failure occurrence node and to replace the parts. The acquired SIM is used in the failure analysis to analyze the failure of Hitachi Data Ingestor.

NOTE: The acquired SIM is the one when the failure occurred or when the communication with the node was disrupted.
Maintenance personnel need to confirm the SIM by connecting the maintenance PC even at the local site.

(3) Based on the acquired TagID and SIM, perform the failure analysis and failure determination operation.
For the details of the failure analysis and the failure determination operation, refer to 'C.2.2 Determination Procedure when a Failure Occurred'.

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C.1.2 When Detected by SNMP Trap

When monitoring by SNMP, a failure detected by HDI is stored in the SNMP Trap server as a failure information equivalent to SIM and reported to the SNMP manager. After that, it is reported to the Maintenance Center of (HDS) by the system administrator. The maintenance personnel should perform the local initial measurement and failure analysis according to the following.

(1) By requesting the system administrator, receive all the SNMP Trap. Maintenance personnel should check the Trap IDs and Trap messages in the received SNMP Trap, and check whether there is a Trap where the SIM of HDI is stored or not. For the details of SNMP Trap where the SIM of HDI is stored, refer to "Troubleshooting '7.2 Messages of Trap that the Maintenance Personnel should Obtain Table 7.2-1 SNMP Trap to be sent by HDI' (TRBL 07-0010).

(2) Based on the management IP address (IP address of the port used in the operation in the single node configuration) of the received failure information, confirm the position of the node where a failure occurred with the system administrator. The confirmed position of the node where a failure occurred is used in the failure analysis for specifying the failure occurrence location and for replacing.
However, if the "KAQK37525-E" SIM message ID is included in the "KAQG46040-E" that is received Trap ID of SNMP Trap, there is a possibility that the system data or the user data has been lost. In this case, it is needed to execute the initial installation of OS and to restore the data from the backup information. For this reason, execute the Table C.1.2-1 or Table C.1.2-2 according to the configuration.

(3) Based on the collected failure information, perform the failure analysis and failure determination operation. For the details of the failure analysis and failure determination operation, refer to 'C.2.2 Determination Procedure when a Failure Occurred'.

Table C.1.2-1 Procedures for restoring data in the node in the configuration using management port

#	Contents	Worker
1	Execute the initial OS installation (with RAID reconfiguration) (*1)	Maintenance personnel
2	Execute setup after installation is completed.	Maintenance personnel
3	Execute the restoration of the system LU (including user data)	System administrator
4	Confirm that no error message related to the file system or the file sharing is output	System administrator
5	In the HDI for Cloud configuration, confirm if the file configuration is consistent between the HDI and the HCP after performing the restoration by using the CLI command which is open to the system administrator.	System administrator
6	Execute the I/O confirmation for the system	System administrator

*1: All data within the node will be initialized.

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Table C.1.2-2 Procedures for restoring data in the node in the configuration using trunk 2 Data ports

#	Contents	Worker
1	Ask the system administrator to search a vacant port of IP-SW of front-end LAN, then connect the Management port of the node to the vacant port with a LAN cable.	Maintenance personnel
2	Execute the initial OS installation (with RAID reconfiguration) (*1)	Maintenance personnel
3	Execute setup after installation is complete (Set the IP address and Routing used for trunk 2 data ports in the front-end LAN to the Management port IP address. (Ask the system administrator about the IP address and Routing for trunk 2 data ports in the front-end LAN.)	Maintenance personnel
4	Execute the restoration of the system LU (including user data)	System administrator
5	After the restoration is completed, remove the LAN cable between IP-SW of front-end LAN and the Management port that was connected at sequence #1 of the node .	Maintenance personnel
6	Confirm that no error message related to the file system or the file sharing is output	System administrator
7	In the HDI for Cloud configuration, confirm if the file configuration is consistent between the HDI and the HCP after performing the restoration by using the CLI command which is open to the system administrator.	System administrator
8	Execute the I/O confirmation for the system	System administrator

*1: All data within the node will be initialized.

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C.1.3 When the System Administrator Noticed a Failure

When the system administrator detected a failure, it is reported to the Maintenance Center of (HDS) by the system administrator. The maintenance personnel should perform the local initial measurement and failure analysis according to the following.
Refer to C.1.3.1 Action to be taken in the cluster configuration for the cluster configuration.

C.1.3.1 Action to be taken in the cluster configuration

(1) When the failure noticed by the system administrator is the ERROR lamp lighting of the node or LED alarm lighting of the parts (power unit, embedded HDD and others)

① Request the system administrator to check the status of the LCD display and LED alarm lighting of the installed parts.

② The confirmed information is used in the failure analysis.

③ Based on the collected failure information, perform the failure analysis and failure determination operation. For the details of the failure analysis and failure determination operation, refer to 'C.2.2 Determination Procedure when a Failure Occurred'.

(2) When the failure noticed by the system administrator is the abnormal OS operation and inaccessible
Request the system administrator if he/she can access the both node with HFSM, and if it can be accessed, check whether failover has occurred or not.

- Proceed to (2-1) if the system administrator cannot access the both nodes with HFSM and installing the management LAN IP-SW provided by (HDS).
- If the management LAN IP-SW owned by the customer is installed, request the customer to determine the failure.
- When the failover has occurred, proceed to step (2-2).
- When the failover has not occurred, proceed to step (2-3).

(2-1) When it cannot access the both nodes with HFSM

① Remove the LAN cable connected to the #7 port on the management LAN IP-SW, and connect the removed LAN cable to the #9 port on the management LAN IP-SW. Request the system administrator to check whether it can communicate with the both nodes with HFSM.
When it is available to communicate, execute the step② to step⑤. When it is not available to communicate, reconnect the removed LAN cable to the port as it was connected, and execute the step⑥.

② Because it is the port failure of the maintenance LAN IP-SW, ask the system administrator to failover the resource group. If the system administrator is not available to operate, maintenance personnel should perform this operation with the permission of the system administrator. Ask the system administrator which node should be used to failover the resource group. If no instruction is given, failover the resource group on the node 1 to the node 0. For the failover procedure, refer to "Maintenance Tool '3.1 Failover Node Termination to Execute the OS stop or OS reboot' (MNTT 03-0000)".

③ Remove the #3 port on the maintenance LAN IP-SW that is connected with the management port on the side of node1, and remove the LAN cable that is connected with the management port on the side of node0.

④ Connect the LAN cable that is removed from #3 on the maintenance LAN IP-SW at the step③ to the management port on the side of node0.

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⑤ Replace the management LAN IP-SW. For the replacement of management LAN IP-SW, refer to "Replacement '1.6 Replacing the Management LAN IP-SW (IP Switch) (1) Replacement procedure while the node is in operation' (REP 01-0290)".
After replacing the management LAN IP-SW, execute the operation described in "Troubleshooting '9.1.2 Confirmation of Recovery from Hardware Failure' (TRBL 09-0010)".

⑥ Request the system administrator to replace the LAN cable that is connected between the HFSM and the management LAN IP-SW, and check if the connection can communicate or not.
If it cannot communicate, it is a failure of the management server. Therefore, request the system administrator to review and replace the management server.

(2-2) When failover has occurred

① Request the system administrator to check SIM. The confirmed SIM is used in the failure analysis.

② Based on the collected failure information, perform the failure analysis and failure determination operation. For the details of the failure analysis and failure determination operation, refer to 'C.2.2 Determination Procedure when a Failure Occurred'.

(2-3) When failover has not occurred

① The system administrator may have performed the incorrect setting. Request the system administrator to recheck the items before and after the setting if there are any errors or not.

② Request the system administrator to acquire the failure information.

③ Execute the manual dump operation. Furthermore, inform the Technical Support Center of the manual dump execution.

④ Send the acquired failure information to the Technical Support Center via e-mail.

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C.1.3.2 Action to be taken it the single node configuration

210hxM of HDI does not support.

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C.1.4 When the Maintenance Personnel Noticed the Failure at the Time of Initial Installation in the Local Site

When the maintenance personnel noticed the ERROR lamp lighting and the LED lighting of the parts of the node in which the failure occurred, perform the local initial measurement and failure analysis according to the following.

(1) Check the alarm lighting of the installed parts and others of the node in which the failure occurred.

(2) Perform “hwstatus” for the node in which the failure occurred.
For the details of “hwstatus”, refer to ‘B.3.1 Displaying the Hardware Status (hwstatus)’.

(3) Acquire the result of “hwstatus”. Note that the connection (remote node BMC connection status) of BMC Information becomes “none” (cluster not built) at the time of initial installation because it is before the cluster building.

(4) Based on the result of “hwstatus”, replace the failure occurrence parts of the failure occurrence node.
For the details of the part replacement, refer to “Replacement ‘Chapter 1 Replacing the Components of Hitachi Data Ingestor’ (REP 01-0000)”.

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C.1.5 Determination Procedure for the Possible Failure Part when a PCI Error Occurred

If SIM message in a failure notice is “KAQK30801-E”, the failure content can be determined by RC information which is included in the SIM message.

Although, in the case the failure content of RC turns out to be a PCI error (PCI PERR, PCI SERR), RC information alone is not enough to determine the possible failure part; you need to refer to another table as described below in that case.

The following is a sample of the RC information in the case of a PCI error (PCI PERR, PCI SERR.)

10 2000 08 07406FF0 XXXXXXXX	<Event description> CPU1 detected IERR. <Cause> BMC detected occurrence of CPU IERR (Internal Error) by monitoring CATERR# signals and MCERR#. <Action> [CHK] # If a PCI PERR/SERR, correctable memory error, or an uncorrectable memory error, or a BIOS-detected uncorrectable bus error occur simultaneously, troubleshoot these errors first. [RPL] 1. Check PCI cards and selectively replace memory attached to CPU1. 2. Try replacing CPU1 and mother board in succession. 3. Check for OS-related problems.

Figure C.1.5-1 RC Information and the Details in the Case of PCI Error (PCI PERR, PCI SERR)

Execute the following procedure when a PCI error (PCI PERR, PCI SERR) described above occurred.

(1) Refer to “Last 4 bytes of RC” column of Table “1. CR210HM (SandyBridge-EP) model” in “Maintenance Manual Hitachi Compute Rack 210HM [System Unit]” which is in the reference page described below and find the appropriate row.
<Reference page>
The reference page (“SELs of PCI PERR and PCI SERR”) is in the file which opens on clicking “Maintenance Manual Hitachi Compute Rack 210HM [System Unit] Appendix b. If the RC corrective action includes descriptions of any of the items below, see the information here.”

(2) Replace the first part described in the column “Slot/Device” of the row you found as the first possible failure part (the first replacement part.) For the replacement procedure, refer to “Maintenance Manual Hitachi Compute Rack 210HM [System Unit] 7 Replacement.”
If the node did not recover from a failure even after the replacement of the first possible failure part (the first replacement part), replace all the rest of the parts described in the column “Slot/Device” of the row you found, and perform the procedure 1 to 3 of “If the above is not successful in isolation.”

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CONTENTS

C.2 Failure Determination Procedure

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C.2 Failure Determination Procedure

C.2.1 Procedures of Troubleshooting at the Time of Setup

(1) Figure C.2.1-1 shows the flowchart when message IDs described in Table C.2.1-1 are output due to the failure of new installation or the failure of update installation.

Table C.2.1-1 List of Message IDs (1)

Message ID	KAQG61007-E KAQG61008-E KAQG61010-E KAQG61025-E KAQG61027-E

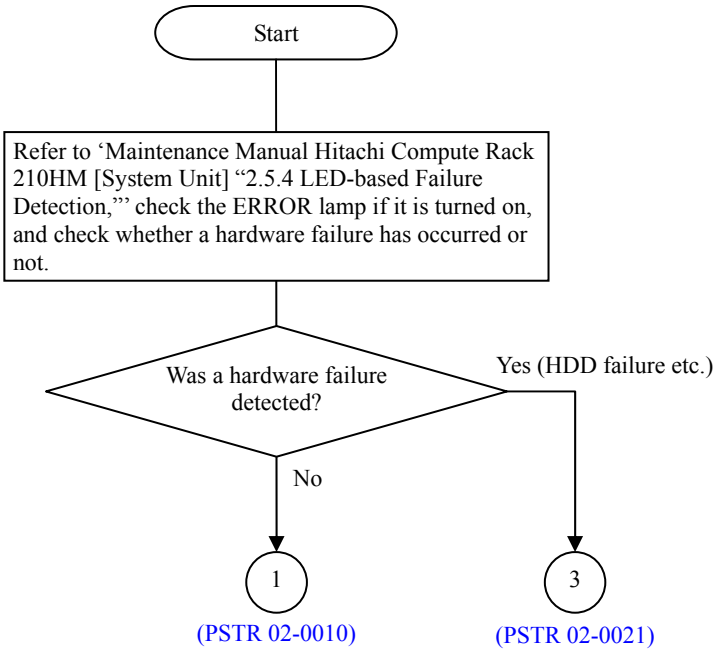

Figure C.2.1-1 Flow of Diagnosis for the Media Failure (1/4)

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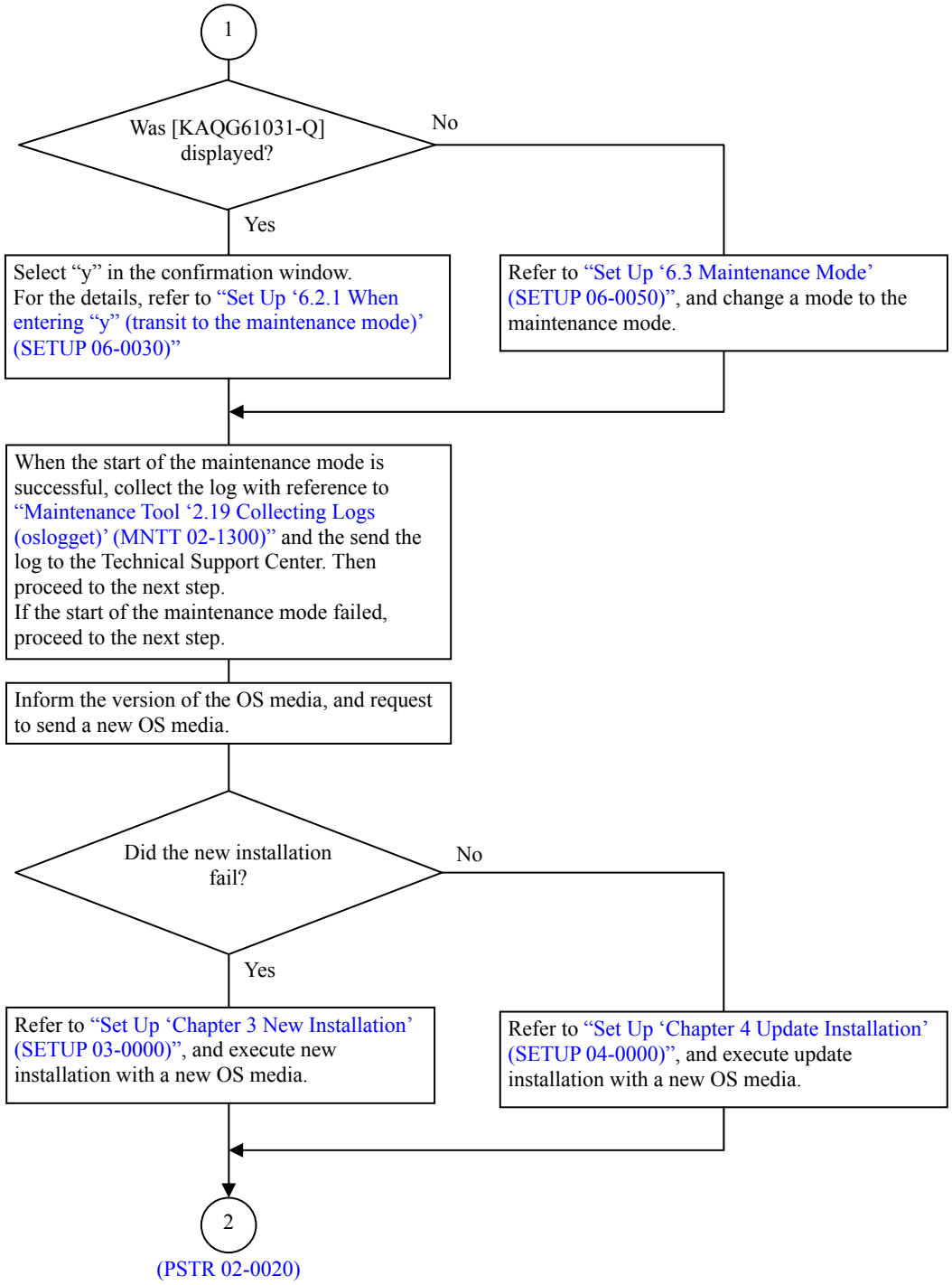

Figure C.2.1-1 Flow of Diagnosis for Media Failure (2/4)

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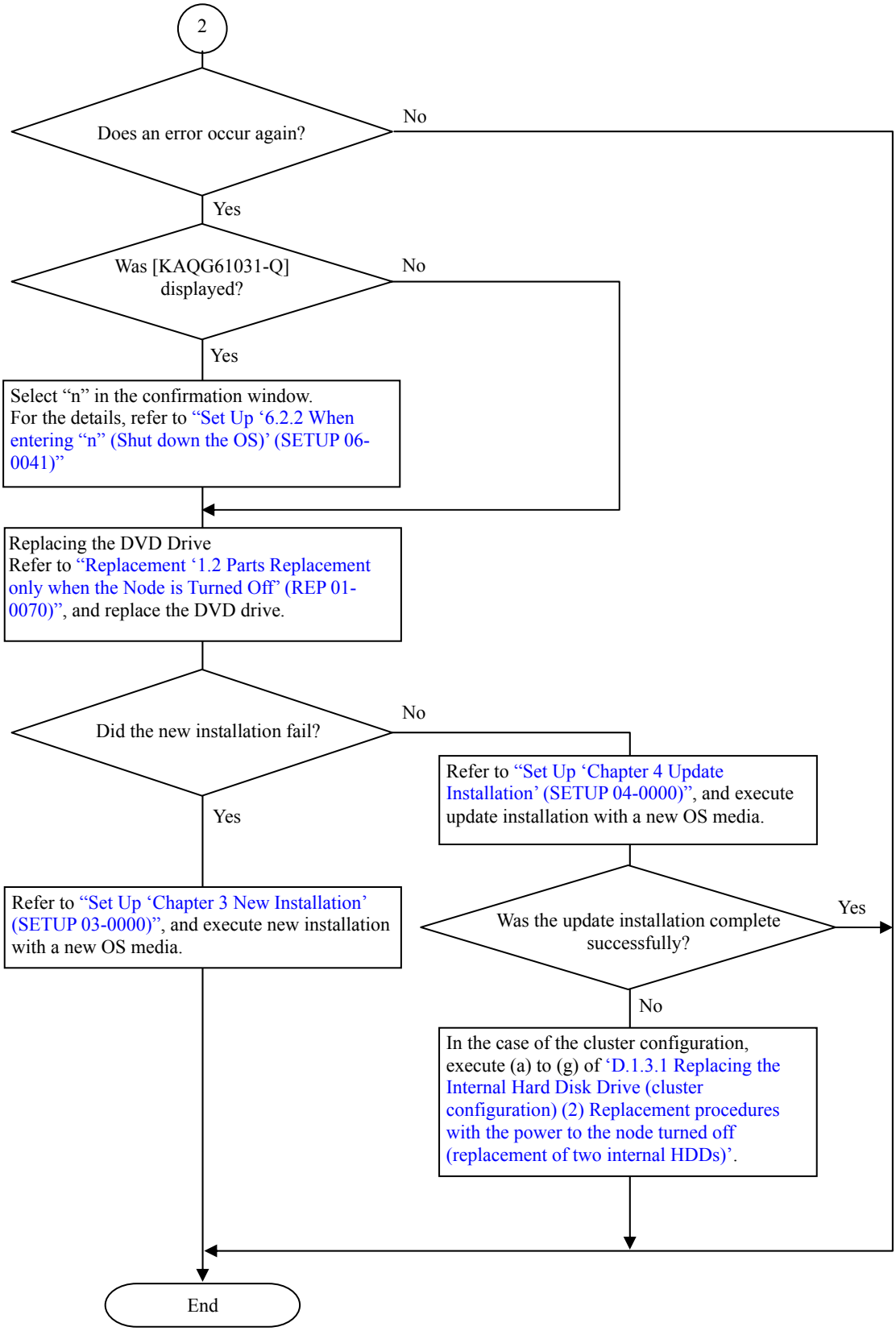

Figure C.2.1-1 Flow of Diagnosis for Media Failure (3/4)

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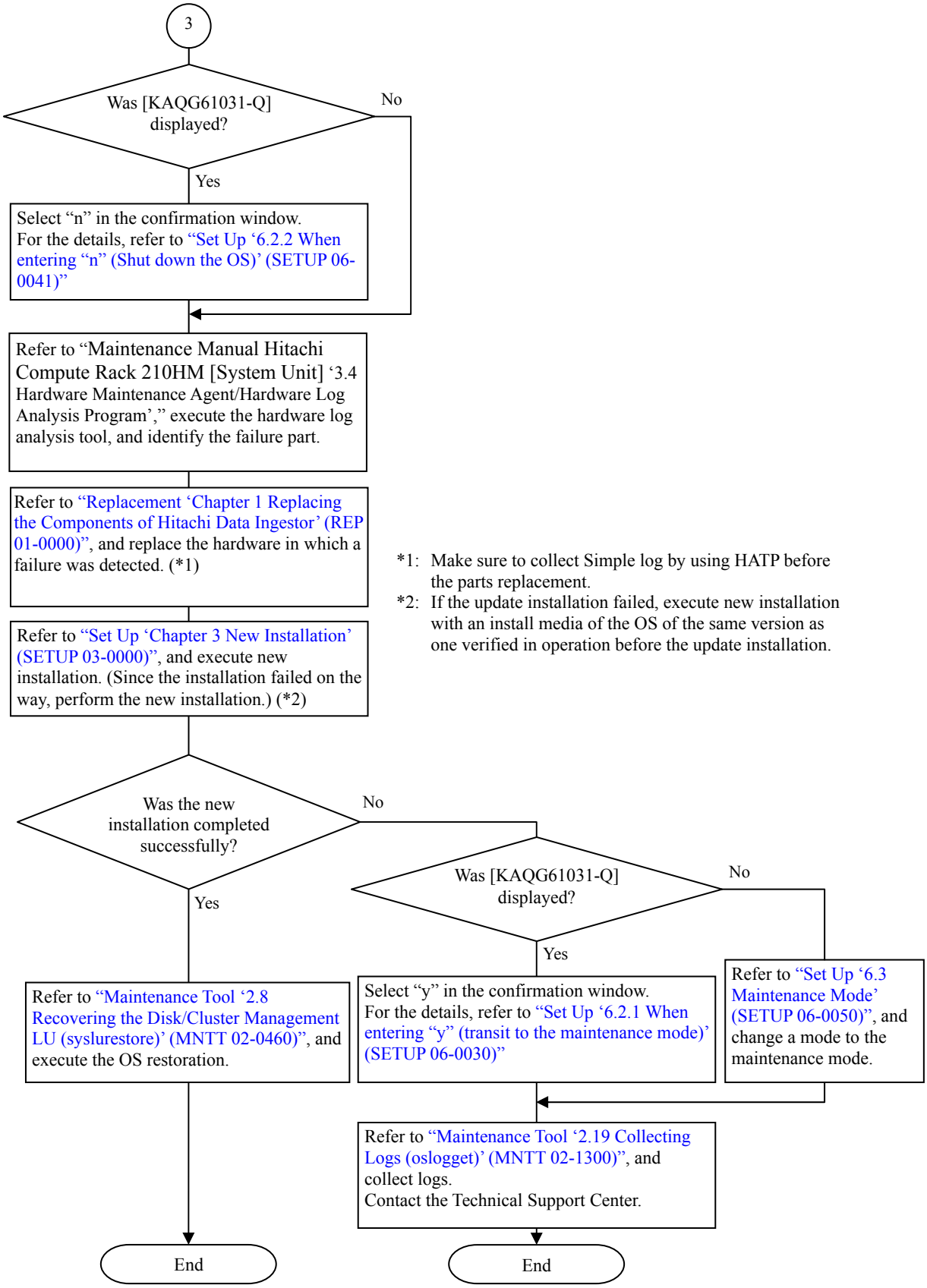

Figure C.2.1-1 Flow of Diagnosis for Media Failure (4/4)

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(2) Figure C.2.1-2 shows the flowchart when message IDs described in Table C.2.1-2 are output due to the failure of new installation.

Table C.2.1-2 Message IDs List (2)

Message ID	KAQG61020-E KAQG61021-E KAQG61022-E KAQG61009-E KAQG61011-E KAQG61012-E KAQG61013-E KAQG61014-E KAQG61015-E KAQM01024-E KAQM01025-E KAQM01026-E KAQM01028-E KAQM01097-E KAQM14105-E KAQM14134-E KAQM14150-E KAQM14152-E

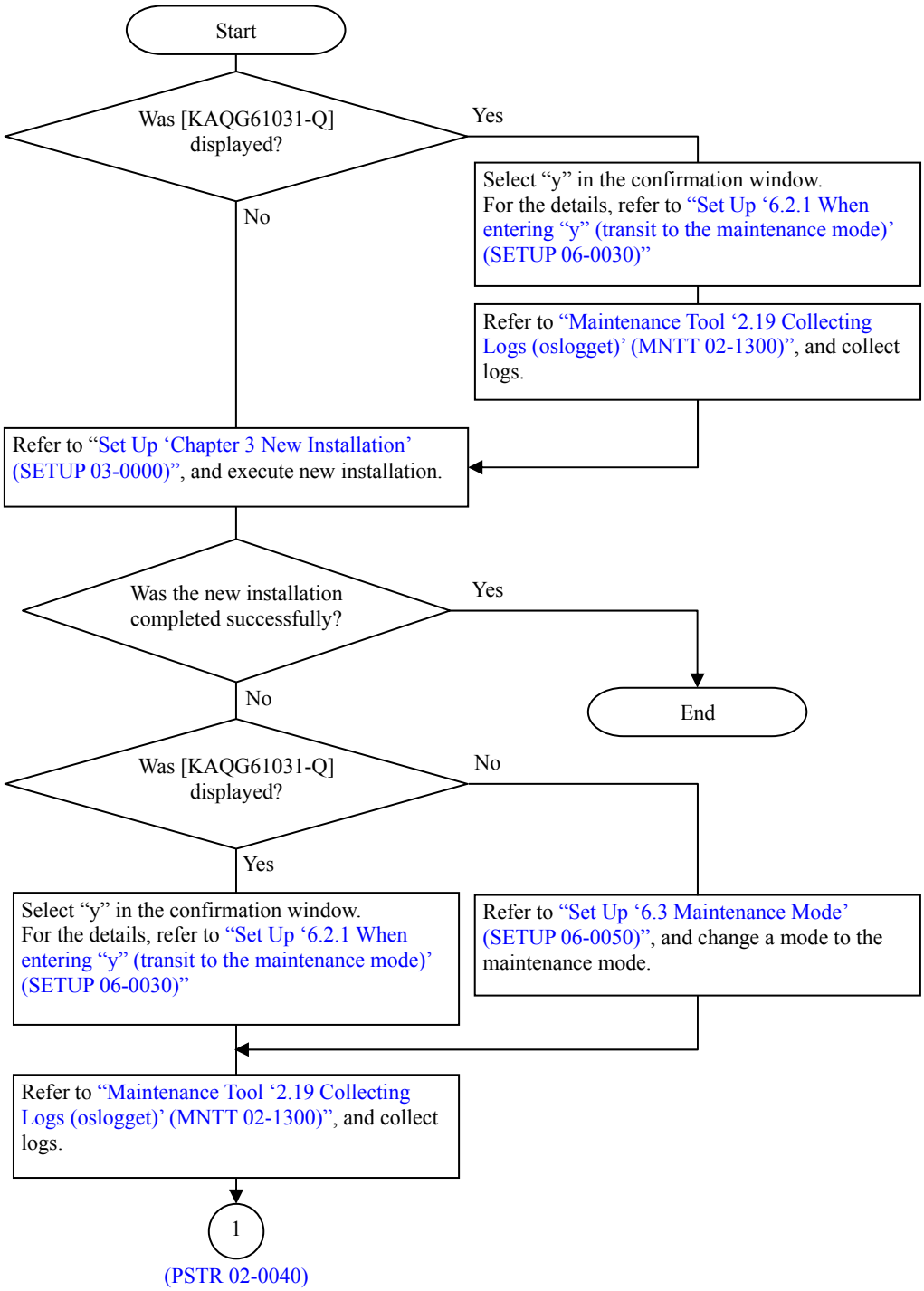

Figure C.2.1-2 Flow of Diagnosis for New Installation Failures (1/2)

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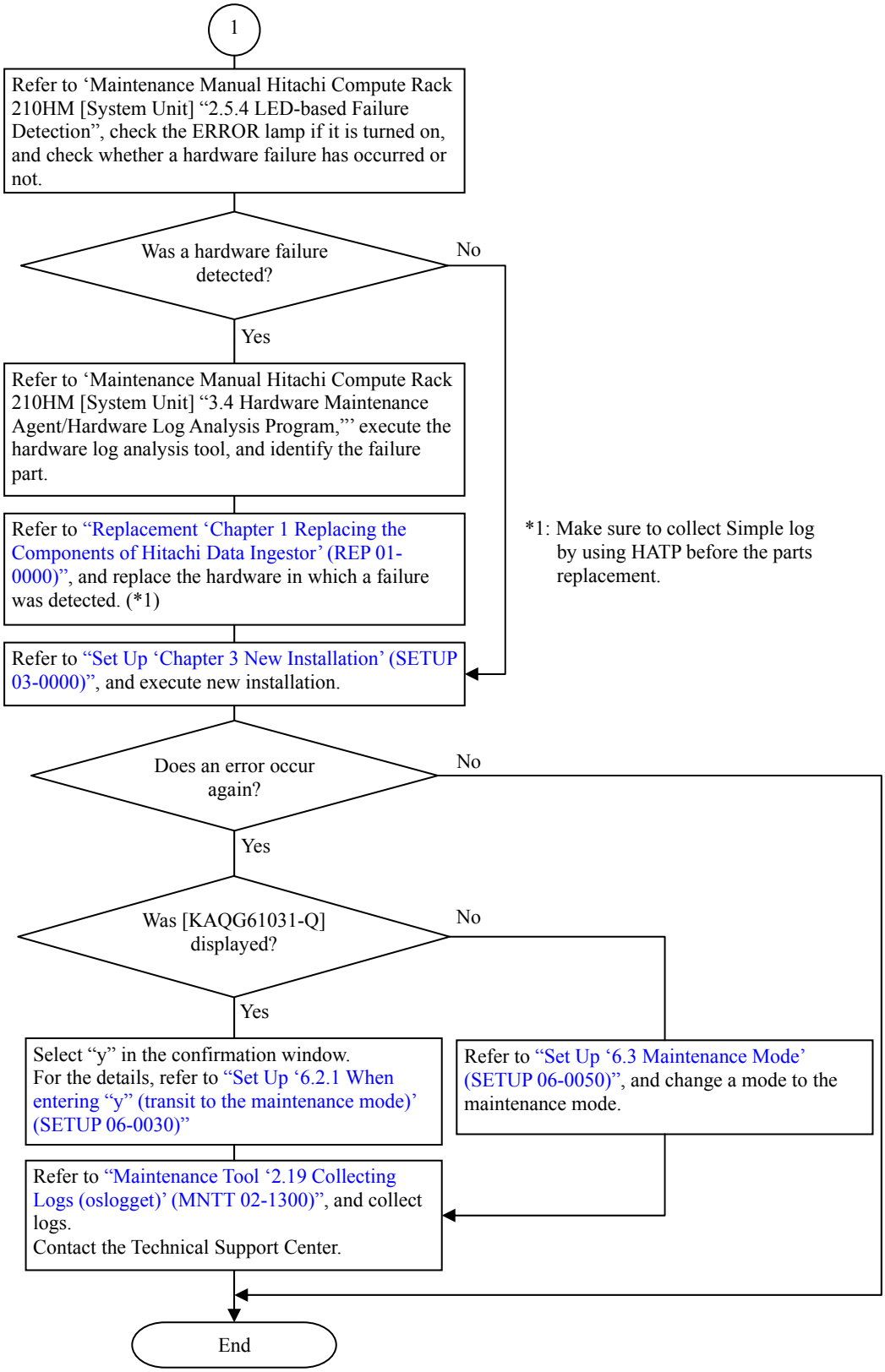

Figure C.2.1-2 Flow of Diagnosis for New Installation Failures (2/2)

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(3) Figure C.2.1-3 shows the flowchart when message IDs described in Table C.2.1-3 are output due to the failure of update installation.

Table C.2.1-3 Message IDs List (3)

Message ID	KAQG61009-E KAQG61020-E KAQG61021-E KAQG61022-E KAQG61011-E KAQG61012-E KAQG61013-E KAQG61014-E KAQG61015-E KAQG61016-E KAQM01024-E KAQM01025-E KAQM01026-E KAQM01028-E KAQM01097-E KAQM14105-E KAQM14134-E KAQM14150-E KAQM14152-E

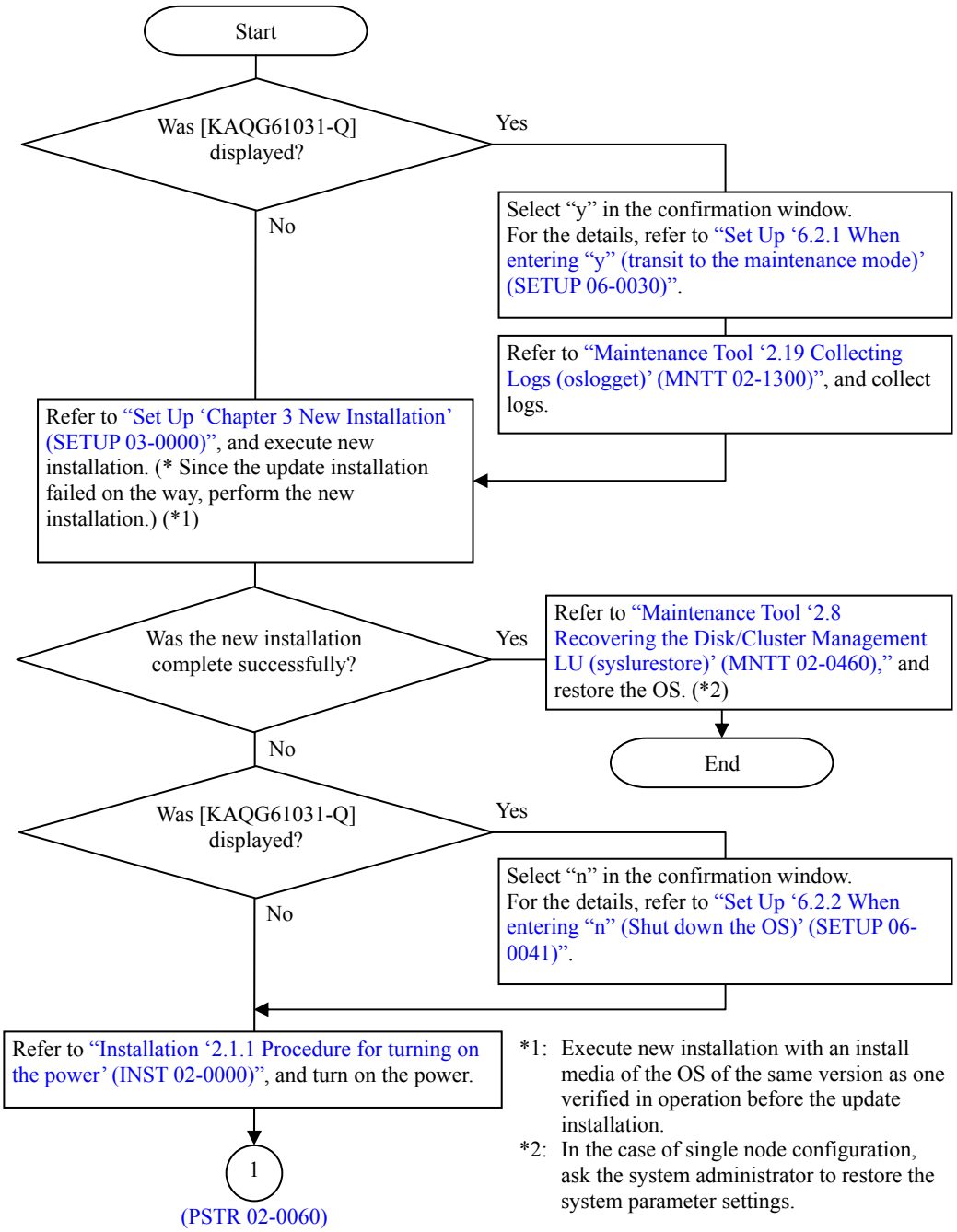

Figure C.2.1-3 Flow of Diagnosis for Update Installation Failures (1/4)

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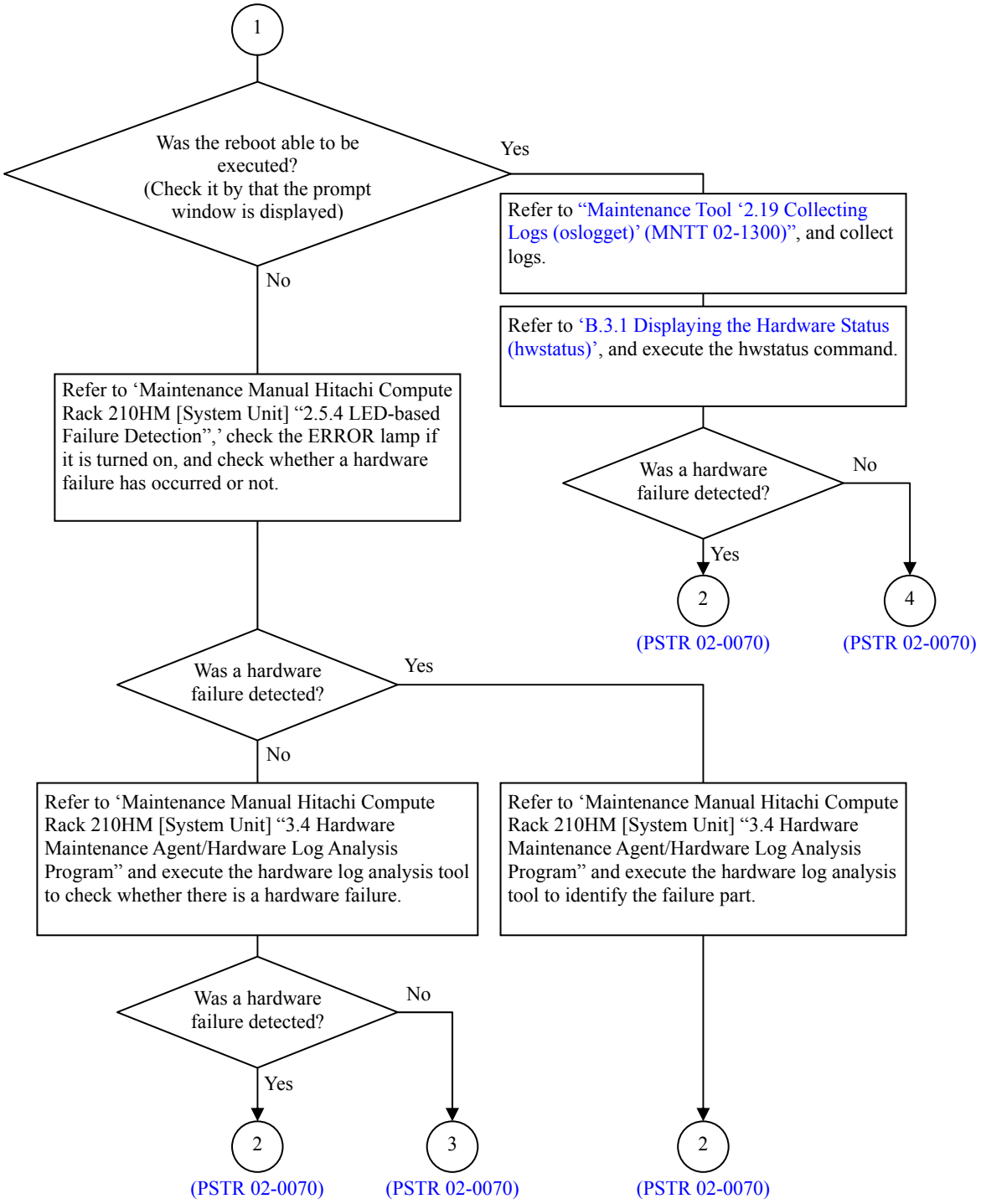

Figure C.2.1-3 Flow of Diagnosis for Update Installation Failures (2/4)

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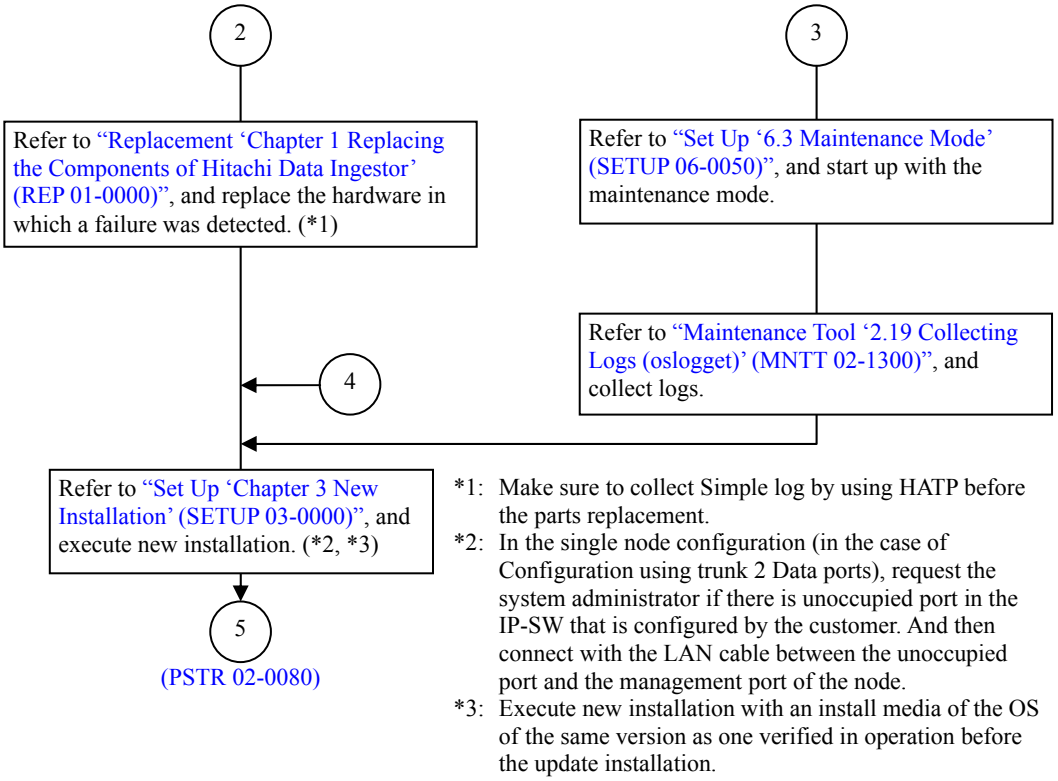

Figure C.2.1-3 Flow of Diagnosis for Update Installation Failures (3/4)

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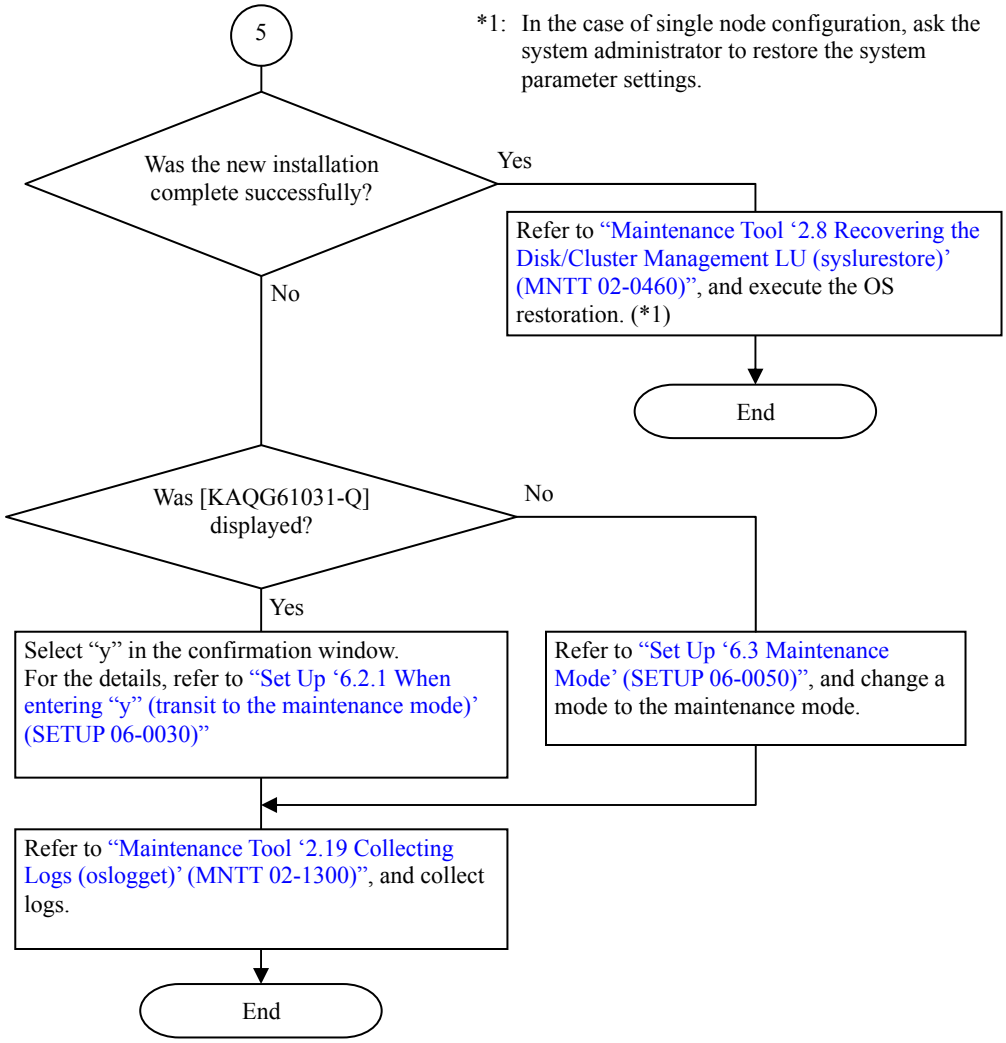

Figure C.2.1-3 Flow of Diagnosis for Update Installation Failures (4/4)

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(4) Figure C.2.1-4 shows the flowchart when message IDs described in Table C.2.1-4 are output due to the failure of update installation.

Table C.2.1-4 Message ID List (4)

Message ID	KAQG61018-W

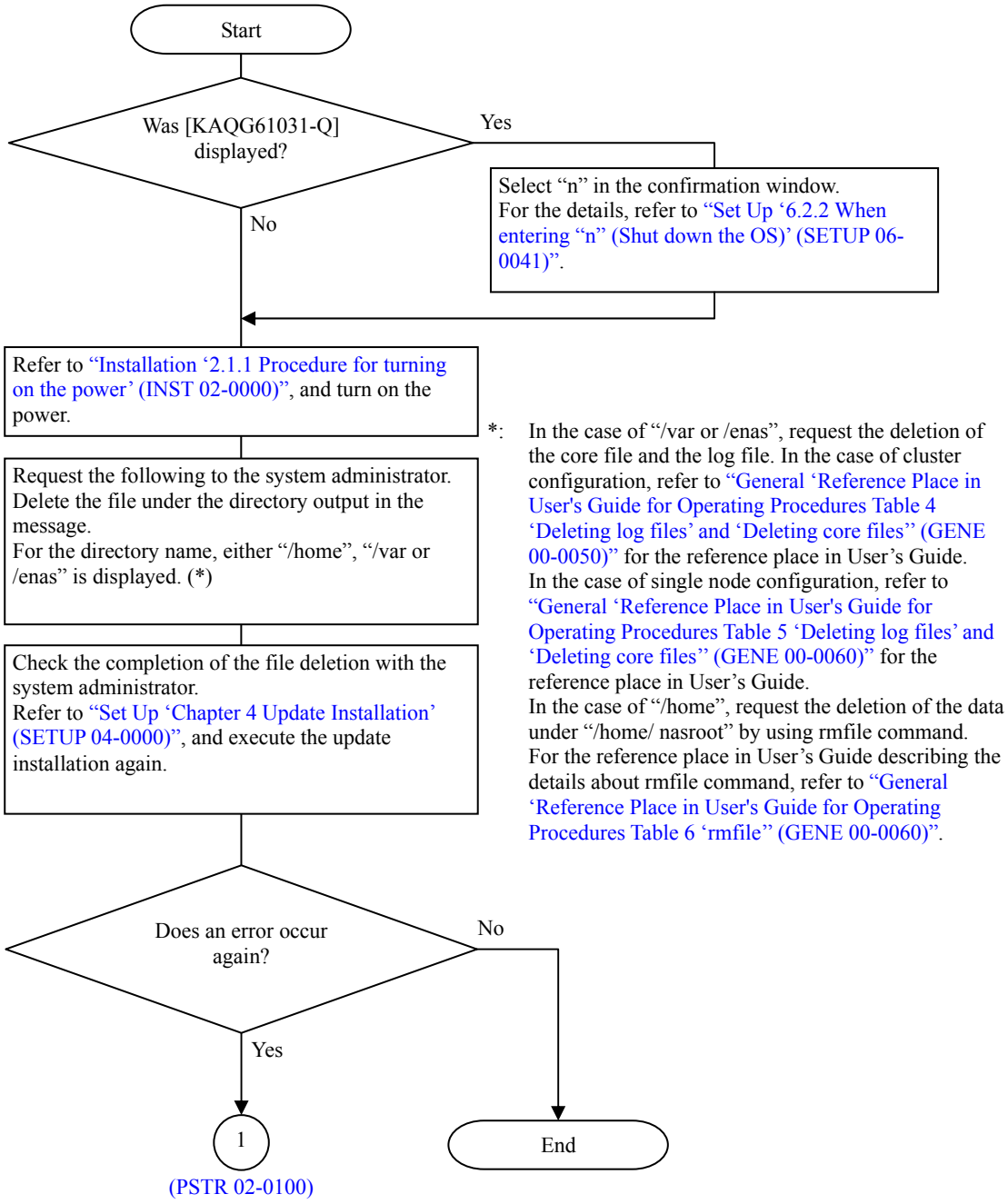

Figure C.2.1-4 Flow of Diagnosis for Lack of Free Space (1/2)

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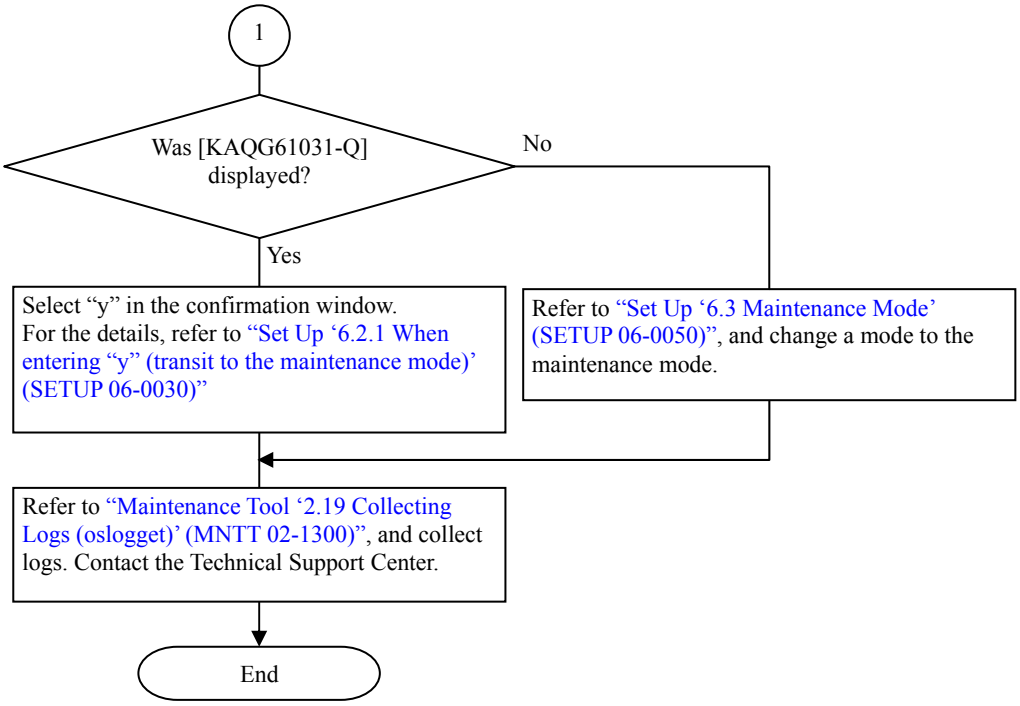

Figure C.2.1-4 Flow of Diagnosis for Lack of Free Space (2/2)

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(5) Figure C.2.1-5 shows the flowchart when message IDs described in Table C.2.1-5 are output by the version check during update installation.

Table C.2.1-5 Message ID List (5)

Message ID	KAQG61024-E

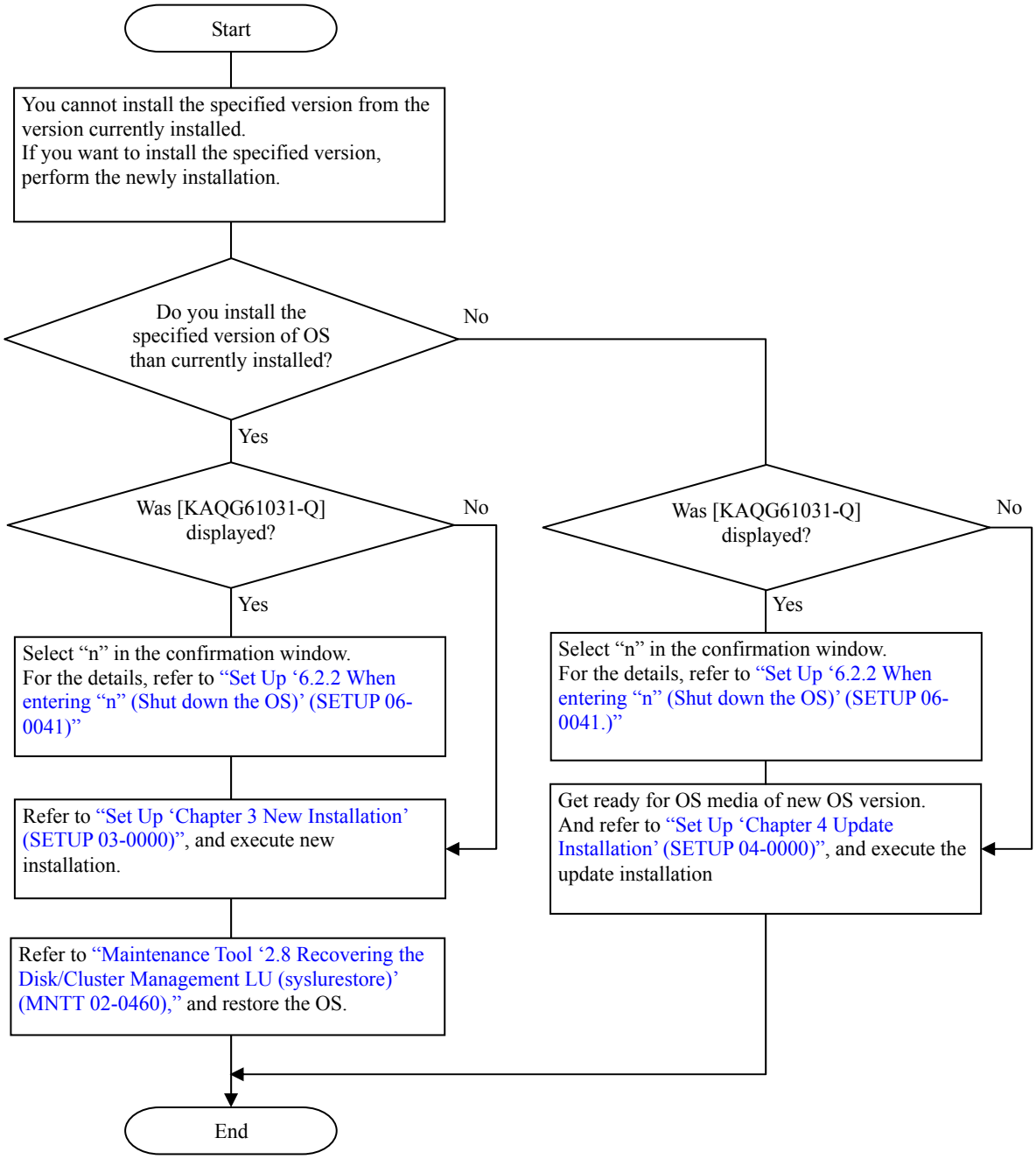

Figure C.2.1-5 Flow of Diagnosis when Checking the Version during Update Installation

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(6) Figure C.2.1-6 shows the flowchart when message IDs described in Table C.2.1-6 are output because the update installation is executed in the state of no OS installed.

Table C.2.1-6 Message ID List (6)

Message ID	KAQG61028-E

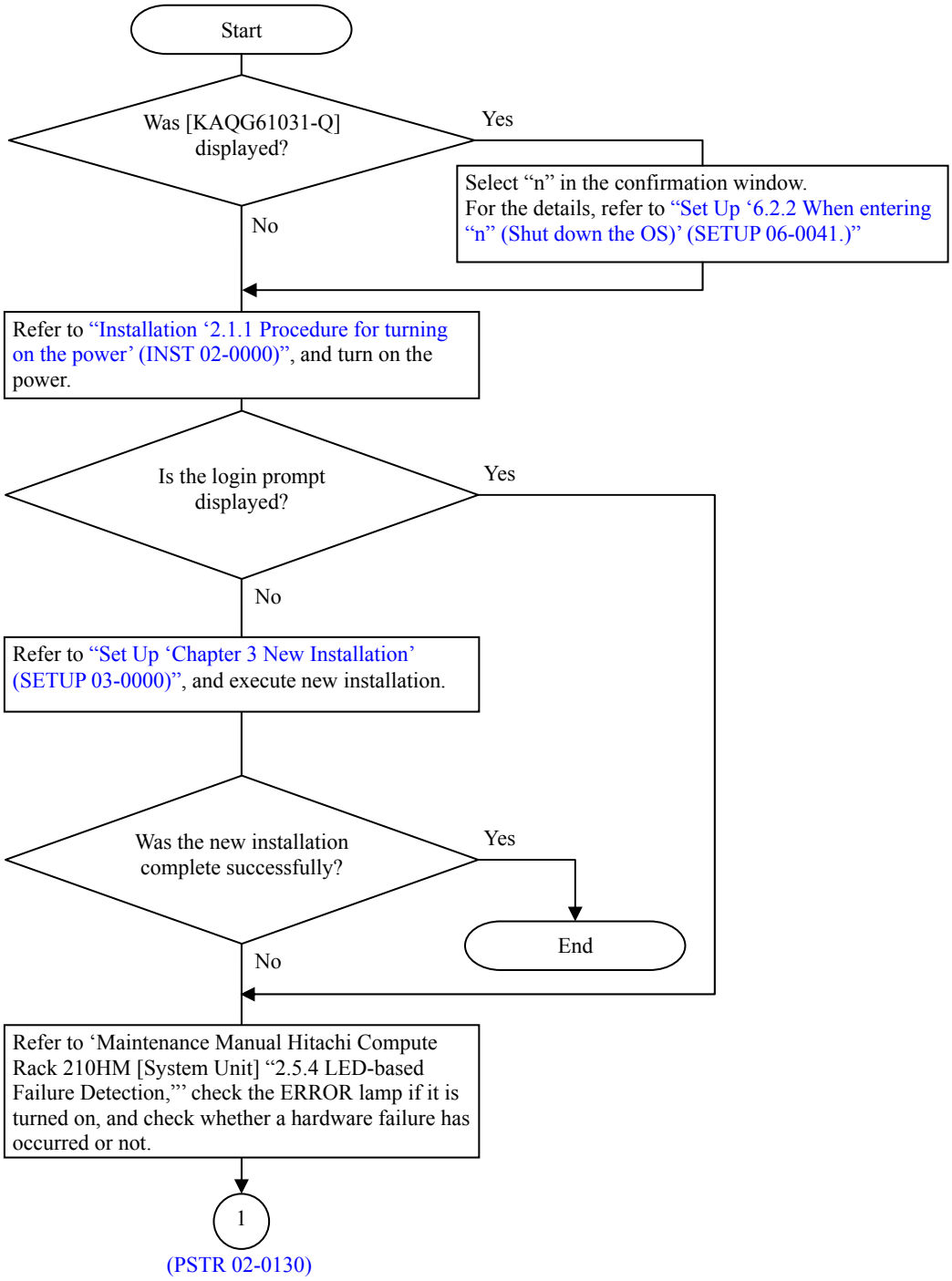

Figure C.2.1-6 Flow of Diagnosis when the Update Installation Failed (1/2)

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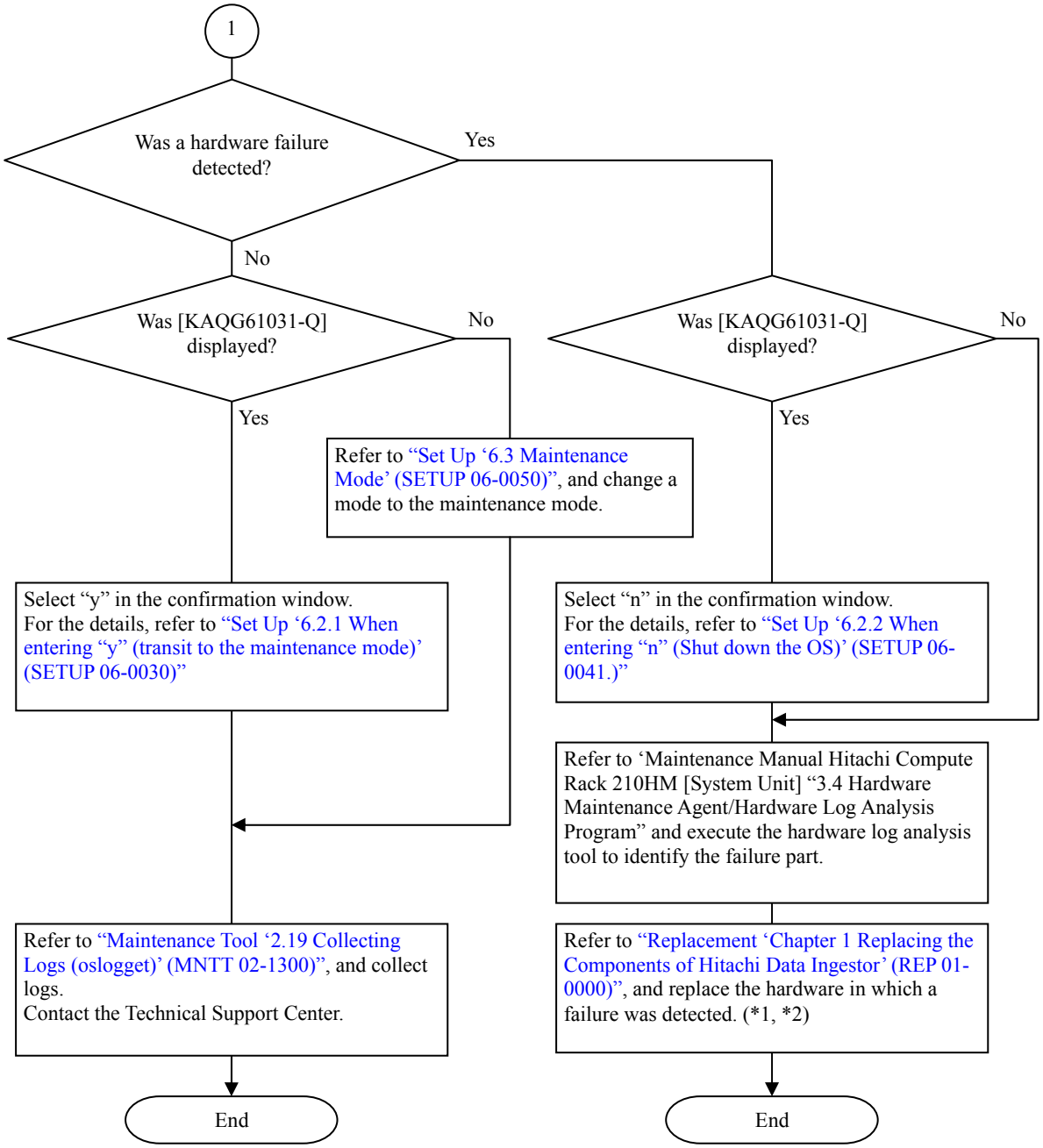

*1: Make sure to collect Simple log by using HATP before the parts replacement.
*2: If the new installation is executed along with the parts replacement, use an install media of the OS of the same version as one verified in operation before the update installation to execute the installation.

Figure C.2.1-6 Flow of Diagnosis when the Update Installation Failed (2/2)

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C.2.2 Determination Procedure when a Failure Occurred

C.2.2.1 Failure determination procedure at the cluster configuration

After checking the power supply and the management system network, the failure is determined to either a hardware system failure or a software system failure depending on whether SIM of failover is acquired or not. The entire flow of the failure determination is shown below.

NOTE:
- When not using KVM, use Remote console as an alternative. To use the remote console, connect maintenance PC with BMC port. After checking the operational status and any failure occurrence on the node, remove LAN cable which is connected to BMC port and then connect Remote console to the BMC port. Note that when you remove LAN cable, a BMC failure message (KAQK337508-W) will be output to the destination node of the resource group.
  In addition, do not perform operations such as failover while using Remote console because a reset demand cannot be received.
- HATP might be used for collecting logs or locating faulty hardware, and be sure to turn off the node before performing HATP.
  Make sure that the CD of HATP is not inserted before turning off the node, or the node cannot be restarted.
- If the OS version 5.1.0-XX and later, and File Version Restore Function is used, “data of the past version directory” might be inaccessible for a moment after performing failover or failback. Contact the system administrator when failover or failback is to be performed.
- If the logical failure is occured on the file system using Active File Migration or Large file transfer, the maintenance personnel might not be able to identify the failure location with the failure determination procedure. Before the completion maintenance procedure, inform system administrator that they can start recovering the work space for AFM.

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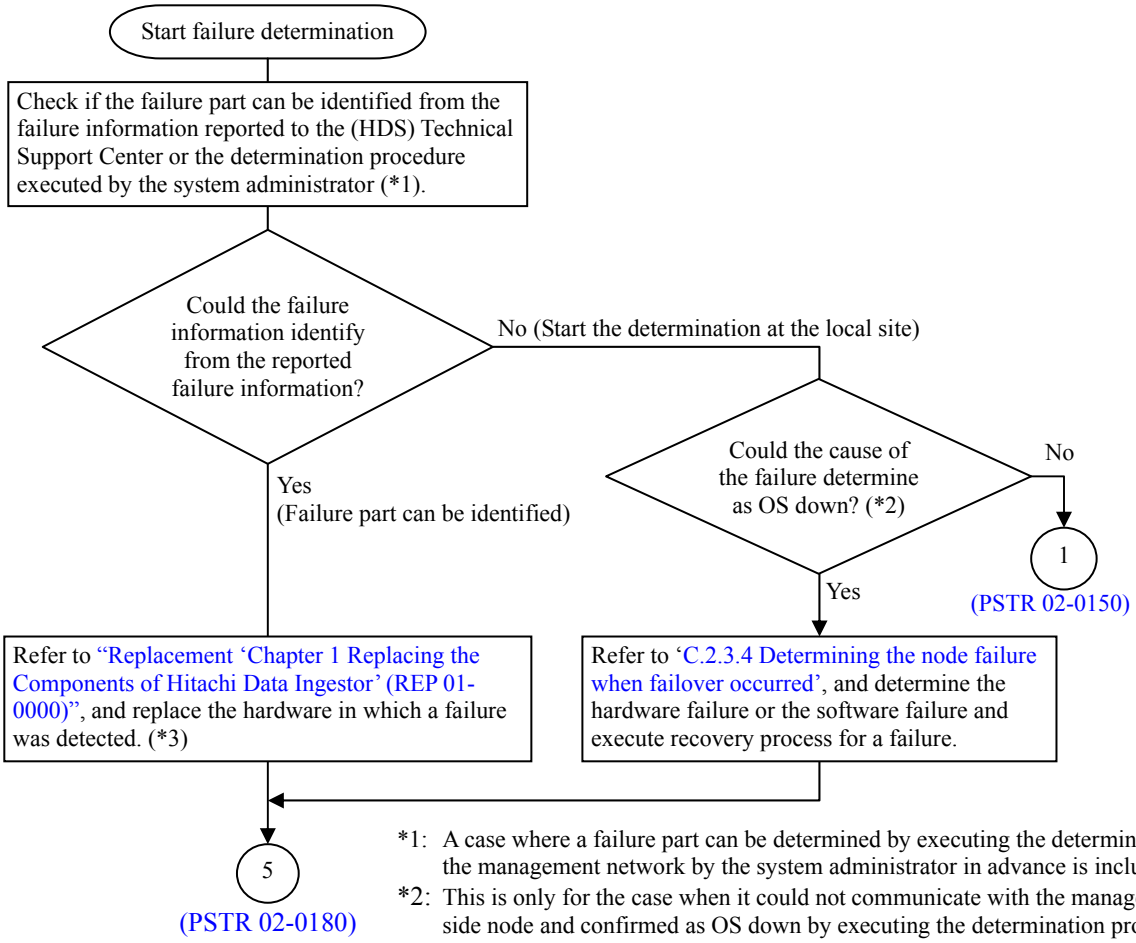

*1: A case where a failure part can be determined by executing the determination procedure at the management network by the system administrator in advance is included.

*2: This is only for the case when it could not communicate with the management port of one side node and confirmed as OS down by executing the determination procedure at the management network by the system administrator in advance.

*3: Make sure to collect Simple log by using HATP before the parts replacement.

Figure C.2.2.1-1 Procedure for determining failures (1/5)

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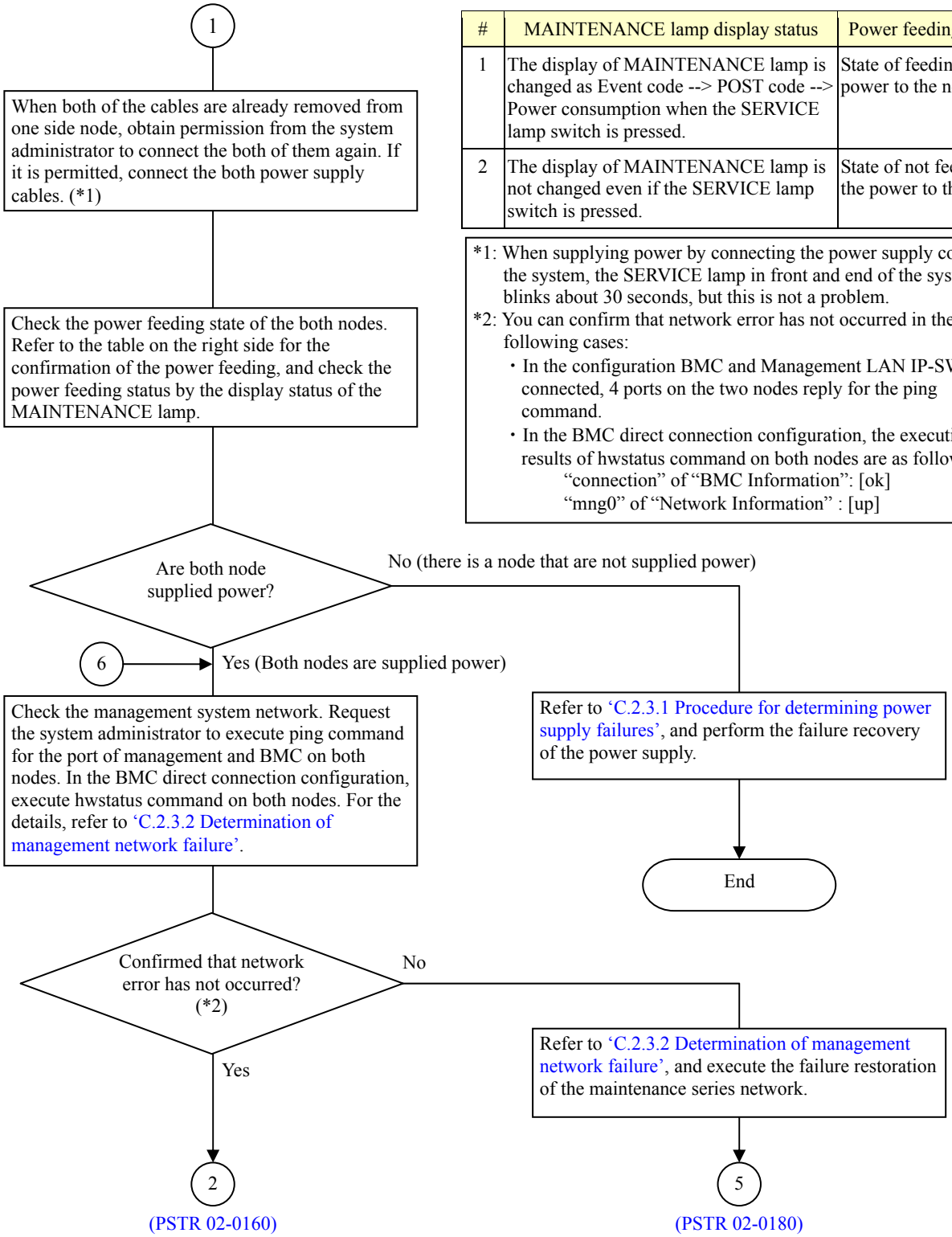

#	MAINTENANCE lamp display status	Power feeding status
1	The display of MAINTENANCE lamp is changed as Event code --> POST code --> Power consumption when the SERVICE lamp switch is pressed.	State of feeding the power to the node.
2	The display of MAINTENANCE lamp is not changed even if the SERVICE lamp switch is pressed.	State of not feeding the power to the node.

*1: When supplying power by connecting the power supply code to the system, the SERVICE lamp in front and end of the system blinks about 30 seconds, but this is not a problem.

*2: You can confirm that network error has not occurred in the following cases:

- In the configuration BMC and Management LAN IP-SW are connected, 4 ports on the two nodes reply for the ping command.
- In the BMC direct connection configuration, the execution results of hwstatus command on both nodes are as follows:
  "connection" of "BMC Information": [ok]
  "mng0" of "Network Information" : [up]

Figure C.2.2.1-1 Procedure for determining failures (2/5)

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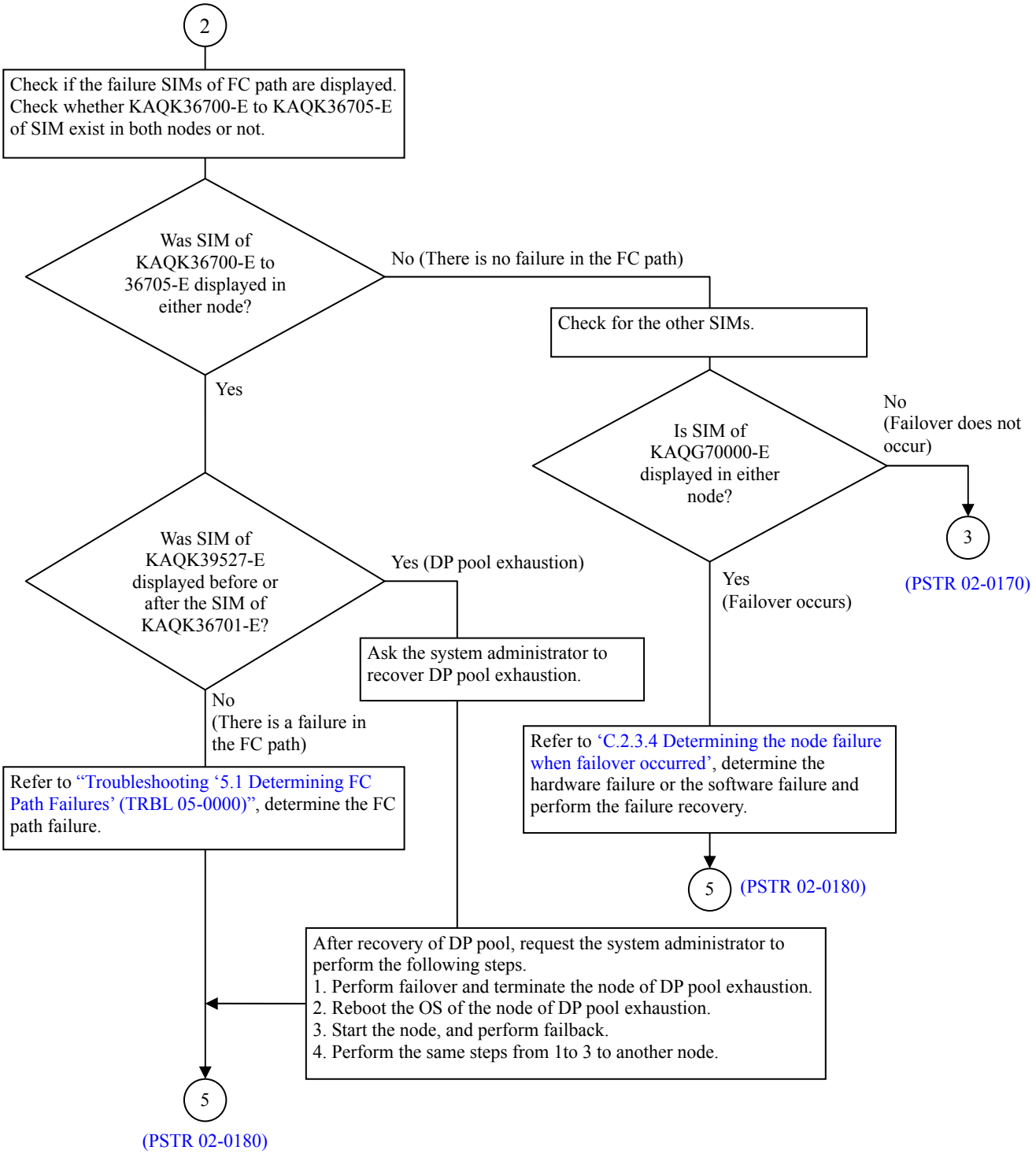

Figure C.2.2.1-1 Procedure for determining failures (3/5)

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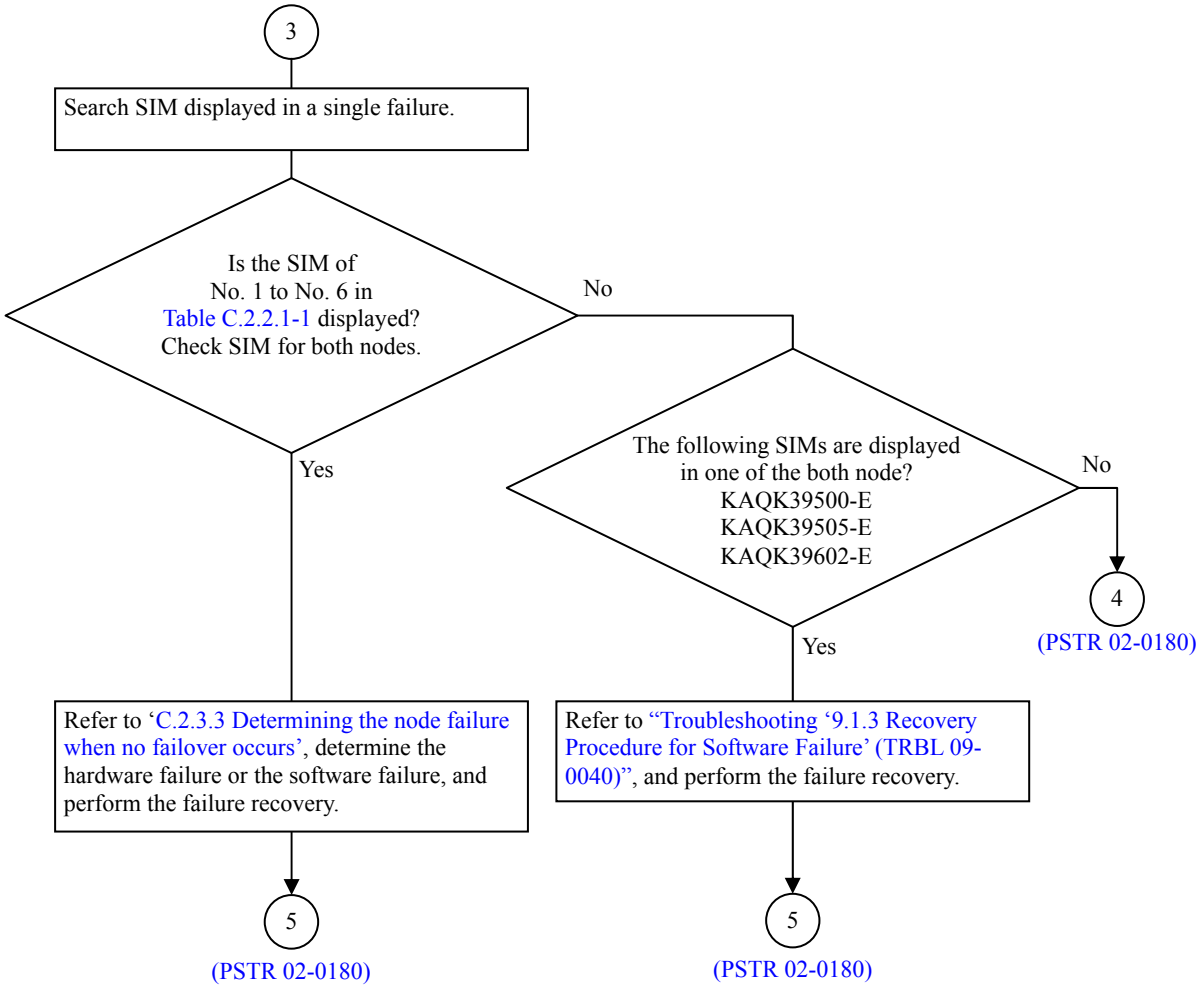

Figure C.2.2.1-1 Procedure for determining failures (4/5)

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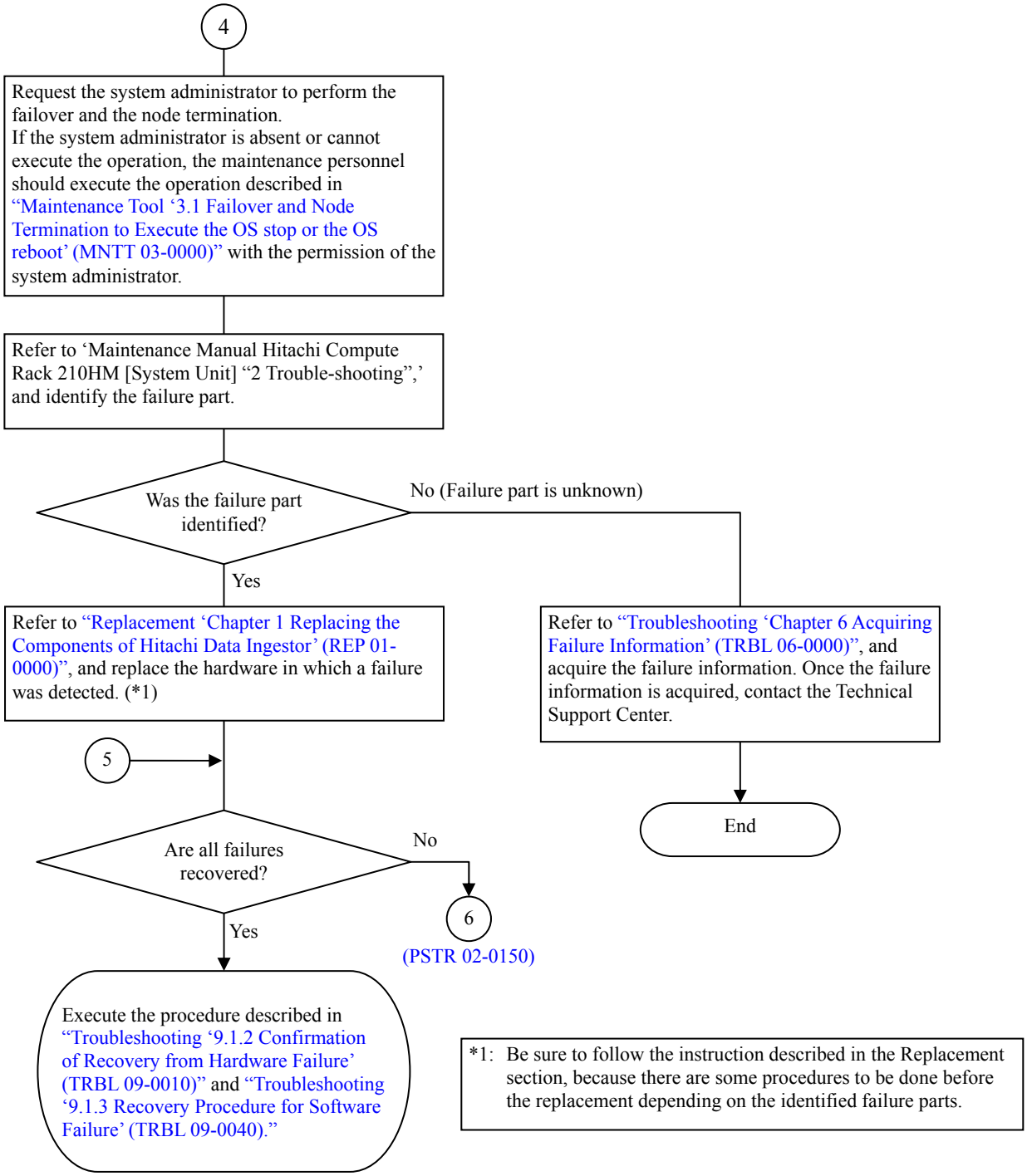

Figure C.2.2.1-1 Procedure for determining failures (5/5)

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Table C.2.2.1-1 Failed parts shown by SIM

#	SIM	Lamp status	Checking the status by the hwstatus command (*1)	Failed part
1	KAQG72012-W	—	Is the Heartbeat LAN port status “Link down”?	Heartbeat LAN port or Heartbeat LAN cable (*2) (*3)
2	KAQG81003-W	—	Is the port status “Link down”?	Extension NIC port or cable (*2) (*3)
3	KAQK30801-E	—	—	Identify the failure part from the RC and continuous log that are described in the SIM. (*4)
4	KAQK39504-E	—	Is the status of all ports of NIC “Link down”?	—
5	KAQK39538-E	—	—	Virtual Server that has Virtual Server ID displayed in a message. (*6)
6	KAQK39527-E	—	—	Pool exhaustion (*5)

*1: For the hwstatus command, refer to ‘B.3.1 Displaying the Hardware Status (hwstatus)’.
*2: When it is not recovered even if the cable is replaced, it is a port failure.
*3: In case of a port failure, ping from the management PC or maintenance PC, and specify which of the nodes has the port failure.
*4: For identifying a failure part from the RC and the continuous log, refer to “Maintenance Manual Hitachi Compute Rack 210HM [System Unit]”.
*5: Ask the system administrator to recover the pool exhaustion.
*6: HDI does not support Virtual Server.

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C.2.2.2 Failure determination procedure at the single node configuration

HDI does not support.

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C.2.3 Detailed Determination Procedure in Each Failure

C.2.3.1 Procedure for determining power supply failures

C.2.3.1.1 Procedure for determining power supply failures in the cluster configuration

The procedure for determining power supply failures is shown in the following flow.
It is assumed that, for one side node, at least one side power supply lamp does not light up or lights up in amber, or the distribution board failure occurred.

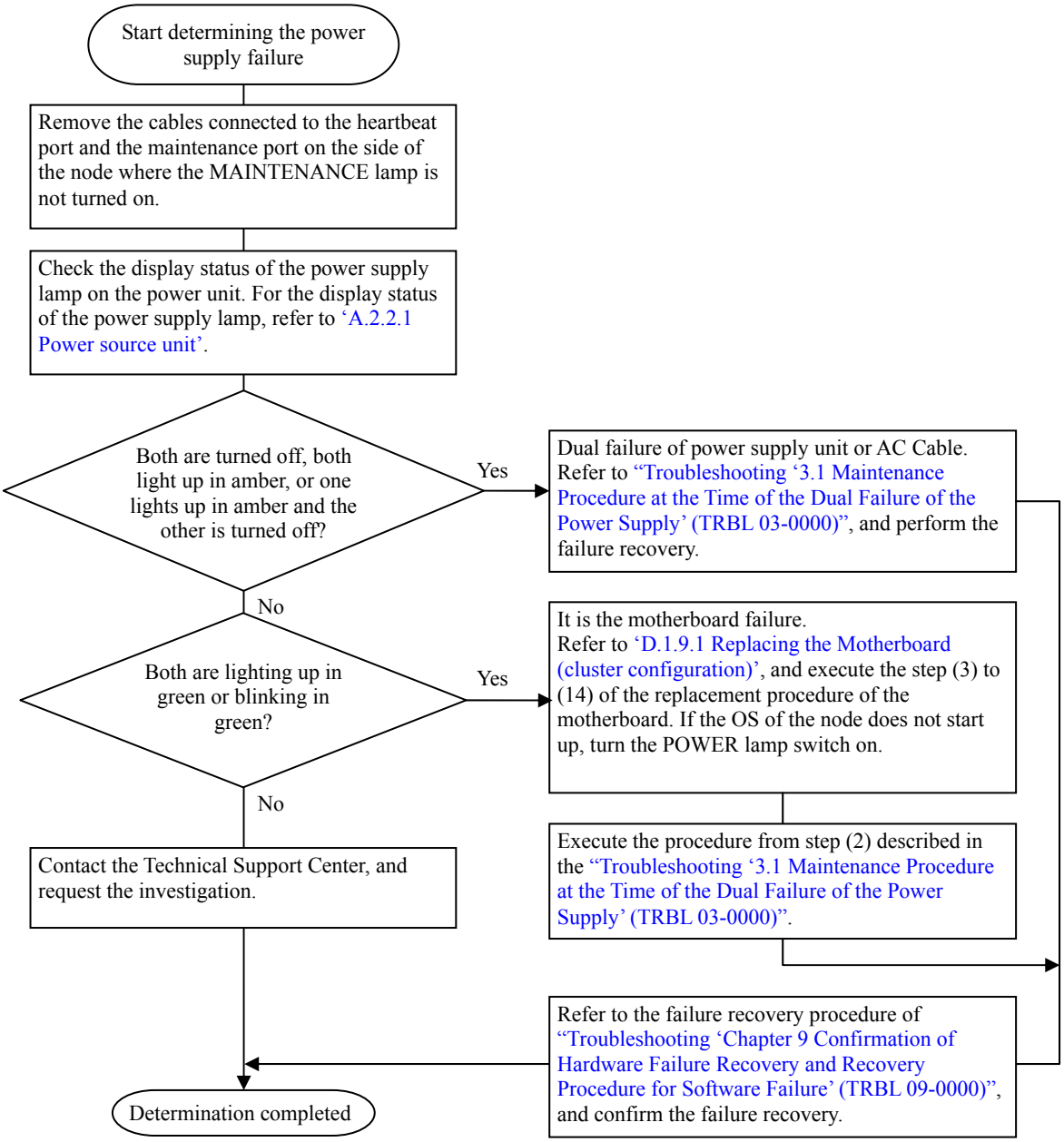

Figure C.2.3.1.1-1 Procedure for determining power supply failures

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C.2.3.1.2 Procedure for determining power supply failures at the single node configuration

HDI does not support.

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C.2.3.2 Determination of management network failure

This chapter describes determination of the management network failure.

When the failure location can be identified from the failure notice, maintenance personnel should perform the recovery operation for the relevant location.

When the failure location cannot be identified, determine the failed part by the determination operation described in this chapter, and then perform the recovery operation.

Check the following before performing the isolation of the failure.

Checking method varies depending on the model. However, confirm the status of the Power LED and the Status LED of IP-SW.

If the Power LED is “Off”, the power is turned off or a power failure. Check the power switch of the management LAN IP-SW, the power cable and the power to be supplied to the management LAN IP-SW. If the switch is not turned off and no problem with the power cable and the power supply, it is the IP-SW failure.

When the Status LED indicates an error, see the manual for the target product to perform the troubleshooting.

Check whether the customer configuration is “BMC and Management SW connection configuration” or “BMC direct connection configuration” before performing ‘C.2.3.2.1 Failure determination by ping command execution result’. If customer cannot judge the configuration, maintenance personnel can find the configuration using the sequences as follows.

(1) If the network segment of the management port is the same as that of BMC port, the configuration is “BMC direct connection configuration”.

Refer to “Maintenance Tool ‘2.11 Displaying the Management Port Information (mngiflist)’ (MNTT 02-0800)” for check of the network segment of the management port.

Refer to “Maintenance Tool ‘2.18 Setting BMC LAN Information (bmcctl)’ (MNTT 02-1210)” for check of the network segment of the BMC port.

(2) If you cannot check the network segment, you must judge the configuration to check the cable connection.

If the BMC port is connected to the IP switch, the configuration is not “BMC direct connection configuration”. If the BMC port is connected to the reset port of the other node, the configuration is “BMC direct connection configuration”.

During the maintenance according to this section, some SIM messages may be issued when you plug in/out the network cable. In this section, do not refer the messages and do perform the isolation flow.

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C.2.3.2.1 Failure determination by ping command execution result

Before performing the operation of management network failure determination, obtain the result (node0: mng0, BMC0 and node1: mng1, BMC1) of the ping command executed by the system administrator. Then, perform the determination operation.
Refer to "Set Up '1.3 Startup confirmation of the OS by using KVM' (SETUP 01-0010)" for check of OS operation status.

(1) Figure 4.1 Overview of Checking by Using ping Command shows an overview of the checking by using the ping command.

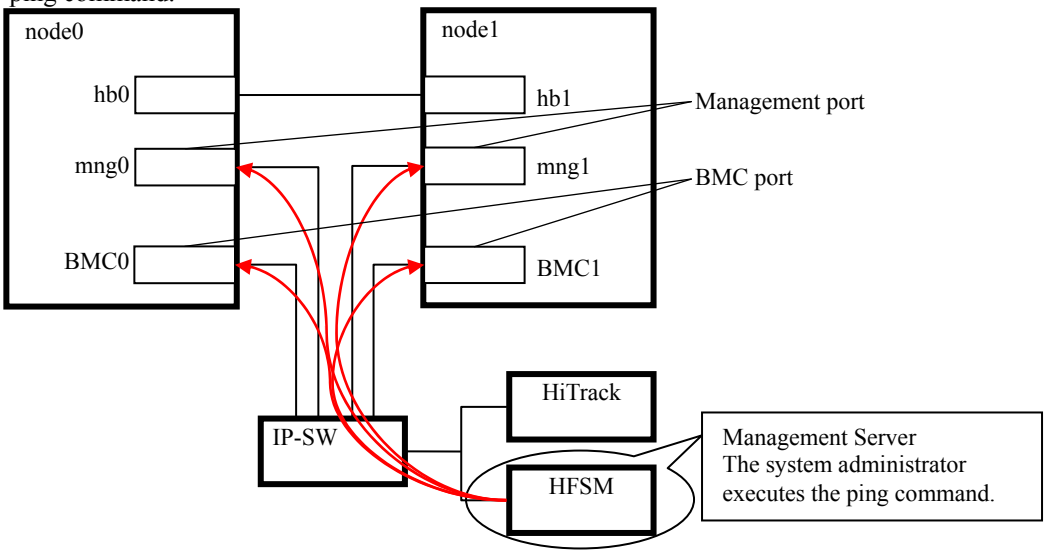

Figure C.2.3.2.1-1 Overview of Checking by Using ping Command

(2) In the case of "BMC direct connection configuration", connect the maintenance PC to pm0, and check the status of OS operation and each ports. If pm0 is in failure, connect the maintenance PC using RS232-C serial cable and check the OS operation status.

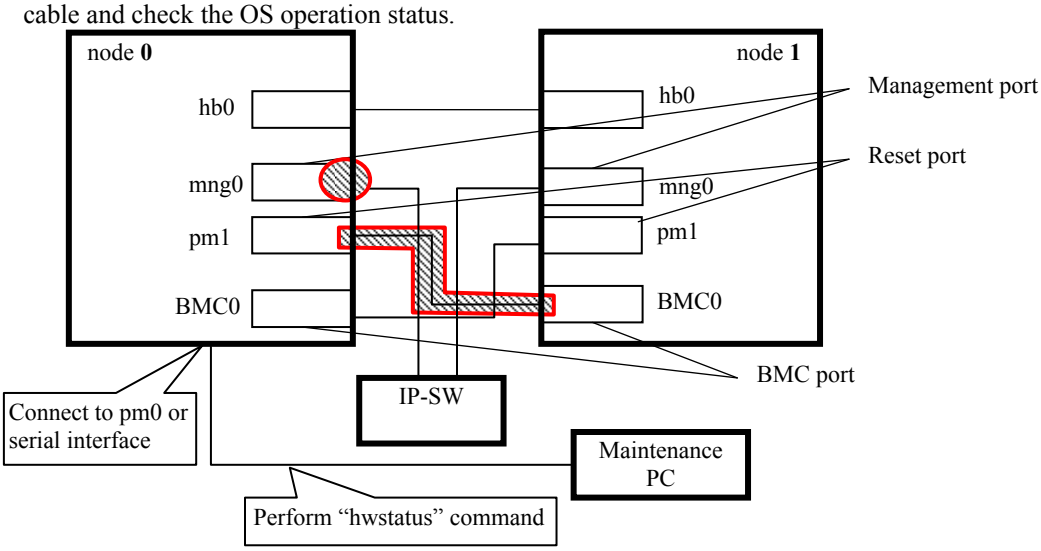

Figure C.2.3.2.1-2 Overview of Checking in the BMC direct connection configuration

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(2-a) Log in to node0 using maintenance PC via ssh or serial interface and check the OS prompt.
Refer to "Maintenance Tool '1.3 Procedures for Operating Commands' (MNTT 01-0200)" for Login.

(2-b) Perform "hwstatus" command to check the status of each port.
Check the mng0, BMC port, and reset port of the node0 (Refer to Figure C.2.3.2.1-3.)
Refer to 'B.3.1 Displaying the Hardware Status (hwstatus)' for the detail of the "hwstatus".

```
$ sudo hwstatus
                    —omitted —
BMC Information
 status             ok
 connection         ok
Network Interface
 mng0               up      linkspeed   : XXXXBase,mediatype:Copper,Management port
 hb0                down    linkspeed   : XXXXBase,mediatype:Copper,Heartbeat port
                    — omitted —
 pm1                up      linkspeed   : XXXXBase,mediatype:Copper,Private maintenance port
$
```

Figure C.2.3.2.1-3 Checking each port using hwstatus

(2-c) After (2-b), connect the maintenance PC to node1, and check the status of mng0, BMC port, and reset port to perform "hwstatus" if you can login to node1.

(2-d) Memorize the result to the table as follows.

Table C.2.3.2.1 Port status summary of BMC direct connection configuration

OS operation status(*1)		mng0(*2)		BMC port		Reset port	
node0	node1	node0	node1	node0	node1	node0	node1
				(*3) (*4)	(*3) (*5)	(*3) (*5)	(*3) (*4)

*1: Mark "up" if you can login from maintenance PC, and mark "down" if you cannot login from maintenance PC.
*2: Mark "Y" if mng0 status is "up", and mark "N" if mng0 status is "down".
If you cannot perform "hwstatus" because you cannot login to the OS, mark "-".
*3: If you cannot perform "hwstatus" because you cannot login to the OS, mark "-".
*4: According to the result of "hwstatus" on the node1,
mark "Y" if the BMC Information is "connection OK", and
mark "N" if the BMC Information is "connection Failed".
*5: According to the result of "hwstatus" on the node0,
mark "Y" if the BMC Information is "connection OK", and
mark "N" if the BMC Information is "connection Failed".

In the case the configuration is "BMC and Management SW connection configuration", based on the result of the ping command execution, determine the failure with reference to the 'Table C.2.3.2.1-1 Matrix Table of Management Network Failures'.
Determination process is the same when the judgment of Yes/No in node0 and node1 are switched.

In the case the configuration is "BMC direct connection configuration", based on the result of the Table C.2.3.2.1, determine the failure with reference to the 'Table C.2.3.2.1-1B Matrix Table of Network Failures in the BMC direct connection configuration.'

If there is no management network failure and the all results of the Y/N judgment for node 0 and node 1of each port shown in Table C.2.3.2.1-1 and Table C.2.3.2.1-2 are "Y", return to the calling process.

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Table C.2.3.2.1-1 Matrix Table of Management Network Failures

#	Management port		BMC port		OS operation status	Resource group operation status (*4)	Assumed failure	Failure determination procedure
	node0	node1	node0	node1				
1	Y	Y	N	N	Both nodes are in operation	Operating in both nodes (Online/No error)	Double failures in the BMC ports or the cables occurred.	Execute the flow of Figure C.2.3.2.2-1. 'C.2.3.2.2 Flow of Management Network Failure Determination (1) Failure in the BMC ports or the cables'
2	Y	Y	Y	N	Both nodes are in operation	Operating in both nodes (Online/No error)	A failure in the BMC ports or the cables occurred.	
3	Y	N	Y	Y	Both nodes are in operation (*1)	Operating in both node or one side node (Online/No error)	Failover (*2) occurred due to a failure in the management port or in the cables.	Execute the flow of Figure C.2.3.2.2-2. 'C.2.3.2.2 Flow of Management Network Failure Determination (2) Failure in the management port or the cables'
						Stopping resource groups in both nodes (The status is srmd executable error)	The resource groups of the both nodes are stopped abnormally because a failure occurs on the maintenance port or the cable, and then restarting is occurred on the other side node.	
					Only one node is in operation (*1)	Operating in one side node (Online/No error)	Reset has been issued due to OS down, and then the failover (*2) has occurred.	'C.2.3.4 Determining the node failure when failover occurred'
4	Y	N	Y	N	—	—	Double or more failures in the ports or the cables have occurred.	'Table C.2.3.2.1-2 Failure Status (Determination of Multiple Failures of #4 through #6)'
5	Y	N	N	Y	—	—	Double or more failures in the ports or the cables occurred.	
6	N	N	Y	Y	—	—	A wrong setting of the management port IP address, both nodes' operating systems down, double or more failures in the ports and the cables, or a failure on the disk array subsystem occurred.	
7	N	N	N	N	Both nodes are in operation (*3)	Operating in both nodes (Online/No error)	A failure in the management IP-SW occurred.	Execute the flow of Figure C.2.3.2.2-10. 'C.2.3.2.2 Flow of Management Network Failure Determination (10) Failure in the management IP-SW'

Y: ping response is returned, N: ping response is not returned

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*1: At the site where the Management LAN IP-SW provided by (HDS) is installed, connect the maintenance PC to the management LAN IP-SW, and check the OS operation status by the ping confirmation for the node that cannot communicate with the management port. If the ping communication is available, determine that the both nodes are in operation.
At the site where the Management LAN IP-SW owned by the customer is installed, connect the maintenance PCs to the maintenance ports of the both nodes directly, and check the OS operation status by the ping confirmation. If the ping communication is available, determine that the both nodes are in operation.
If the ping communication is not available, just one side node is in operation.

*2: When the failover of resource group is complete, "Running node" of the both resource groups becomes the same node name. For the details about "Running node", refer to "Maintenance Tool '2.2 Displaying the Cluster Status (clstatus)' (MNTT 02-0040)".

*3: Connect the maintenance PC directly to the maintenance ports of both nodes and check the OS operation status by the ping communication. If the ping communication is available, determine that the node is in operation.

*4: Check the resource group operation status when the resource group is in operation. When the resource group is in operation, check the operation status.

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Table C.2.3.2.1-1B Matrix Table of Network Failures in the BMC direct connection configuration (1/2)

#	OS operation status		Management port (mng0)		BMC port (BMC)		Reset port (pm1)		Assumed failure	Failure determination procedure
	node0	node1	node0	node1	node0	node1	node0	node1		
1	up	up	Y	Y	Y	N	N	Y	One or two failure(s) in the BMC ports, the reset ports of the other node, or the cables occurred.	Execute the flow of Figure C.2.3.2.2-1.
					N	Y	Y	N		
					N	N	N	N		
2	up	up	Y	N	Y	Y	Y	Y	A failure in the management ports or the cables occurred.	Execute the flow of Figure C.2.3.2.2-2.
			N	Y	Y	Y	Y	Y		
3	up	up	Y	N	Y	N	N	Y	Double or more failures in the ports or the cables have occurred. - mng0/cable - BMC port of the same node (or Reset port /cable of the other node) [note] If management port have the service IP, failover had been occurred and service is continued. Maintain the offline node first.	Execute the flow of Figure C.2.3.2.2-3.
			N	Y	N	Y	Y	N		
4	up	up	Y	N	N	Y	Y	N	Double or more failures in the ports or the cables have occurred. - mng0/cable - Reset port of the same node (or BMC port /cable of the other node) [note] When you replace the BMC port, we must stop all services. Maintain “mng0 failed node” first.	Execute the flow of Figure C.2.3.2.2-5.
			N	Y	Y	N	N	Y		
5	up	up	N	N	Y	Y	Y	Y	A failure in the management IP-SW, mng0, or setting mistake occurred.	Execute the flow of Figure C.2.3.2.2-7.

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Table C.2.3.2.1-1B Matrix Table of Network Failures in the BMC direct connection configuration (2/2)

#	OS operation status		Management port (mng0)		BMC port (BMC)		Reset port (pm1)		Assumed failure	Failure determination procedure
	node0	node1	node0	node1	node0	node1	node0	node1		
6	up	down	Y	–	–	Y	Y	–	Failover occurred because of OS down. (*1)	Execute the flow of Figure C.2.3.2.2-6.
	down	up	-	Y	Y	–	–	Y		
7	up	down	Y	–	–	N	N	–	Double or more failures have occurred. - OS down - Reset port of the same node (or BMC port /cable of the other node) [note] The service is continued. Maintain the failed node after stopping the service of the failed node.	Execute the flow of Figure C.2.3.2.2-4.
	down	up	–	Y	N	–	–	N		
8	up	down	N	–	–	Y	Y	–	Double or more failures have occurred. - OS down - Mng0 port of the other node	Execute the flow of Figure C.2.3.2.2-8.
	down	up	–	N	Y	–	–	Y		
9	down	down	–	–	–	–	–	–	OS double failures (including software failures) have occurred.	Execute the flow of Figure C.2.3.2.2-9.

*1: When the failover of the resource group is completed, the “Running node” status of the both node show us the same node name. Refer to “Maintenance Tool ‘2.2 Displaying the Cluster Status (clstatus)’ (MNTT 02-0040)” for the detail of the “Running node”.

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Table C.2.3.2.1-2 Failure Status (Determination of Multiple Failures of #4 through #6) (1/2)

Item number in Table C.2.3.2.1-1	Condition for determination		Details of failure	Recovery operation	Failure determination procedure (*3)
	Failover completion (*1)	OS operation status			
4	Y or N	Both nodes are in operation (*4)	Failures have occurred in the management port/cable, BMC port/cable of the same nodes.	Perform failover when the virtual IP address is set on the management port. The OS service continues running. Replace the failed part.	Execute the flow of Figure C.2.3.2.2-3.
	Y	Only one node is in operation (*4)	Failures of OS down and of BMC port/cable have occurred on the same node.	The OS service is continued. However terminate the service on the failure side, and then replace the failed part.	Execute the flow of Figure C.2.3.2.2-4.
5	Y or N	Both nodes are in operation (*2)	① A failure has occurred in the BMC port/cable. ② A failure has occurred also in the management port/cable of the other node.	Perform the management port recovery operation first, because if you perform the BMC port recovery operation first, the node in normal service must be terminated.	Execute the flow of Figure C.2.3.2.2-5.
	Y	Only one node is in operation (*2)	① Reset has been issued due to OS down, and the failover is being executed. ② A failure has occurred in the BMC port/cable of the other node.	Perform the replacement operation for the OS downed node first, because if you perform the replacement operation for the BMC port first, the node which can be failed over will not exist.	Execute the flow of Figure C.2.3.2.2-6.

*1: Failover completed: Y, Failover not completed: N.
When resource groups are in operation and the failovers are complete, "Running node" of the both resource groups becomes the same node name. For the details about "Running node", refer to "Maintenance Tool '2.2 Displaying the Cluster Status (clstatus)' (MNTT 02-0040)".

*2: Check the logon prompt indication for the node that cannot communicate with the management port with the connection by the remote console. In the node displaying the logon prompt, the OS is in operation. And for the node that can communicate with the management port, determine that the node is in operation.
For the remote console connection, refer to 'B.1.3 Connection Confirmation of the Remote Console' and for the OS operation status, refer to 'B.1.4 Startup Confirmation of the OS by Using Remote Console'.

*3: For the failure determination procedures, follow 'C.2.3.2.2 Flow of management network failure determination'.

*4: At the site where the Management LAN IP-SW provided by (HDS) is installed, connect the maintenance PC to the management LAN IP-SW, and check the OS operation status by the ping confirmation for the node that cannot communicate with the management port. If the ping communication is available, determine that the both nodes are in operation.
At the site where the Management LAN IP-SW owned by the customer is installed, connect the maintenance PCs to the maintenance ports of the both nodes directly, and check the OS operation status by the ping confirmation. If the ping communication is available, determine that the both nodes are in operation.
If the ping communication is not available, just one side node is in operation. In this case, borrow a monitor and a keyboard to be connected to the node from the system administrator because the confirmation might not be available by the remote console connection.

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Table C.2.3.2.1-2 Failure Status (Determination of Multiple Failures of #4 through #6) (2/2)

Item number in Table C.2.3.2.1-1	Condition for determination			Details of failure	Recovery operation	Failure determination procedure (*3)
	Failover completion (*1)	OS operation status (*2)	Resource group operation status (*5)			
6	Y or N	Both nodes are in operation	Both nodes are in operation (Online/No error)	Failures have occurred in the management port/cable of the both nodes. (*4)	As the communication is enabled via the heartbeat cable, the OS service is continued. Execute the replacement operation for each node one by one by terminating it by manual failover.	Execute the flow of Figure C.2.3.2.2-7.
	Y	Only one node is in operation	Only one node is in operation (Online/No error)	① Reset has been issued due to the OS outage, and the failover is being executed. ② After the failover completion, a failure has occurred in the management port/cable of the other node.	As the OS service is continued by the failover, execute the replacement operation by terminating the node of failed OS.	Execute the flow of Figure C.2.3.2.2-8.
	Y	Only one node is in operation	Resource groups of both nodes terminated (Error status is srmd executable error)	After a failure occurred on the side of the maintenance port and failover is executed, a failure of the service termination on both nodes occurred due to OS down on the other side node.	Terminate the node that failed, and recover it.	
	N	No node is in operation	Command cannot be executed because no node is in operation.	OS double failures have occurred.	Execute checking by using the diagnostic tool of the hardware vendor. Check also the Disk Array Subsystem.	Execute the flow of Figure C.2.3.2.2-9.

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*1: Failover completed: Y, Failover not completed: N.
When the resource groups are in operation and the failovers are complete, “Running node” of the both resource groups becomes the same node name. For the details about “Running node”, refer to “Maintenance Tool ‘2.2 Displaying the Cluster Status (clstatus)’ (MNTT 02-0040)”.

*2: Check the logon prompt indication of node by connecting the remote console. In the node displaying the logon prompt, the OS is in operation. By switching the logon prompt indication confirmation in each place of connecting node, the state of both nodes operation can be checked.
For the remote console connection, refer to ‘B.1.3 Connection Confirmation of the Remote Console’ and for the OS operation status, refer to ‘B.1.4 Startup Confirmation of the OS by Using Remote Console’.

*3: For the failure determination procedures, follow ‘C.2.3.2.2 Flow of management network failure determination’.

*4: There is a case that Failover does not occur, and a case that Failover has completed. Failover does not occur when a case that the maintenance ports of the both nodes have failed at the same time.

*5: Check the resource group operation status when the resource group is in operation. When the resource group is in operation, check the operation status.

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C.2.3.2.2 Flow of management network failure determination

By following this section, perform the operation of the management network failure determination.

Execute the failure determination flow by following “Table C.2.3.2.1-1 Matrix of Management Network Failures”, “Table C.2.3.2.1-1B Matrix of Network Failures in the BMC direct connection configuration”, or “Table C.2.3.2.1-2 Failure Status (Determination of Multiple Failures of #4 through #6)”.

(1) Failure in the BMC ports or the cables

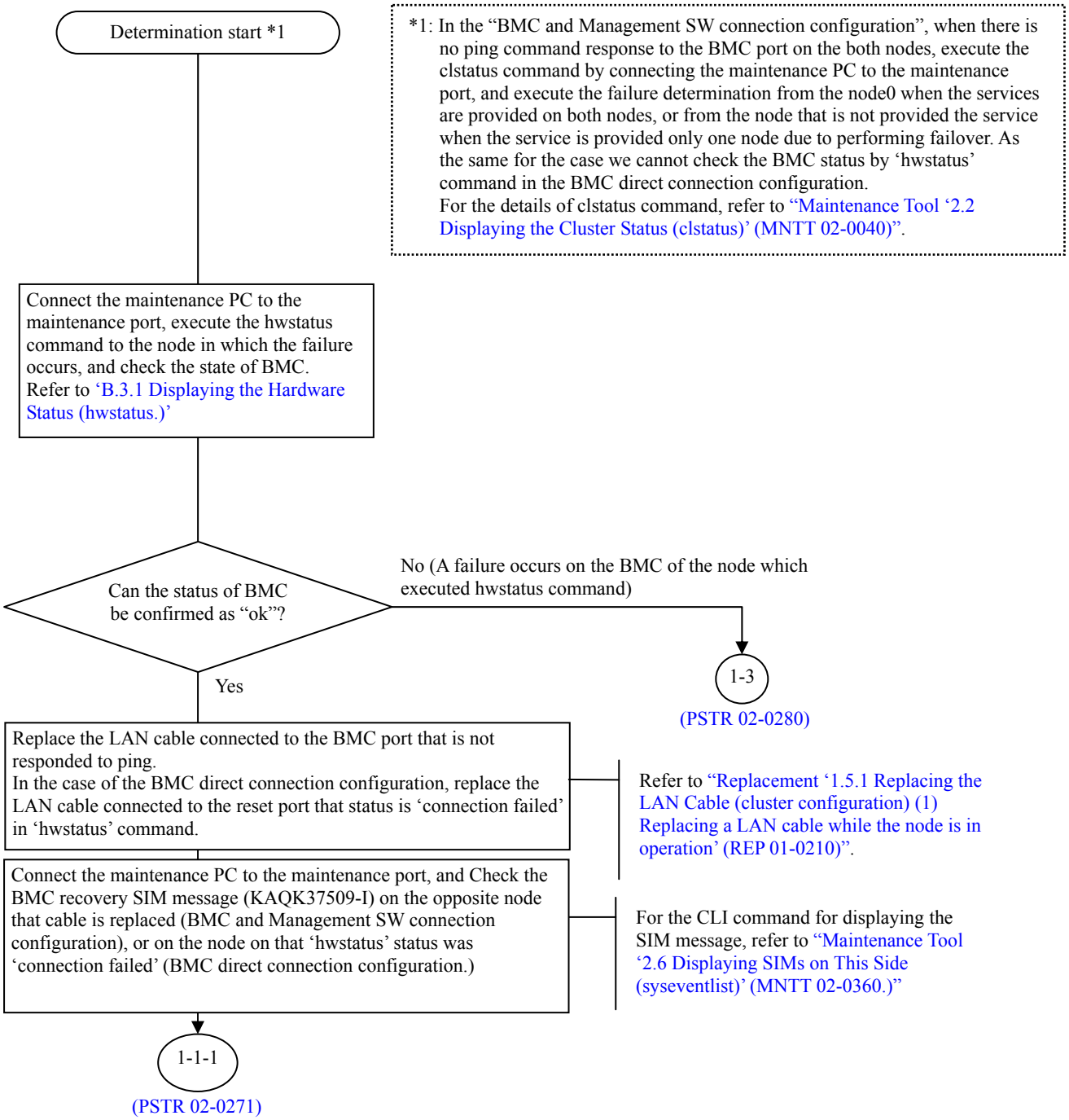

Figure C.2.3.2.2-1 Flow of Management Network Failure Determination (1/9)

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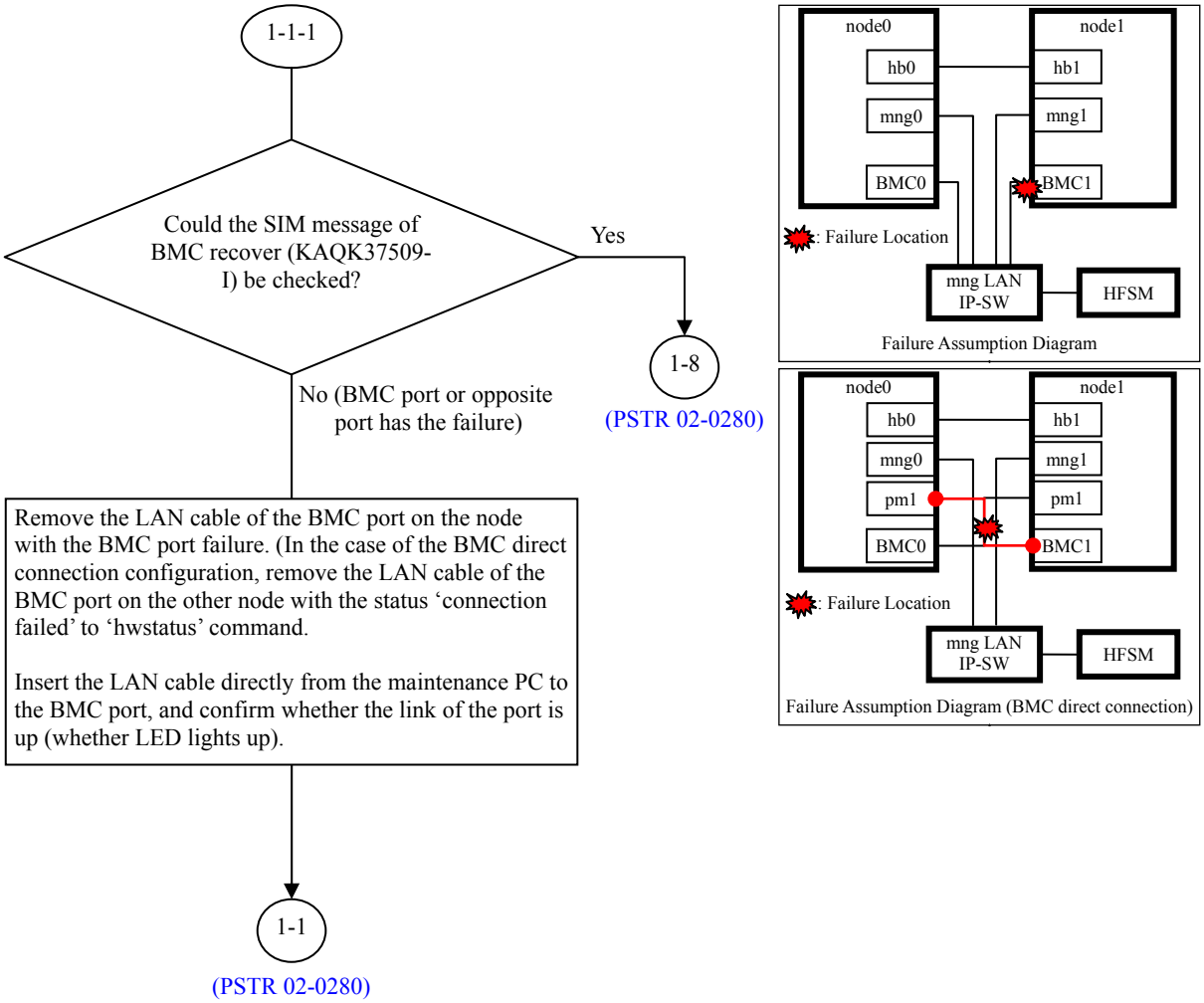

Figure C.2.3.2.2-1 Flow of Management Network Failure Determination (2/9)

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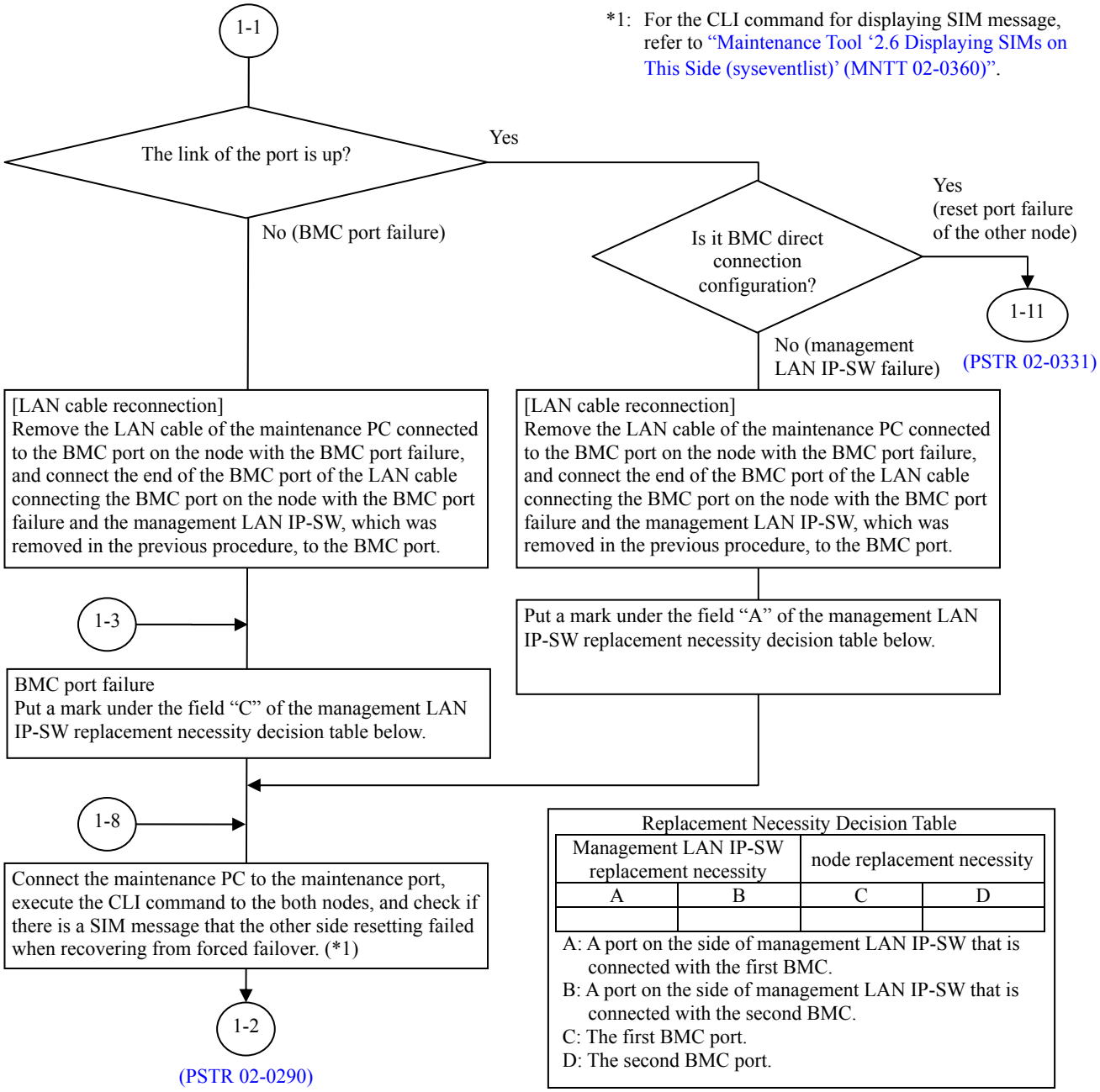

Figure C.2.3.2.2-1 Flow of Management Network Failure Determination (3/9)

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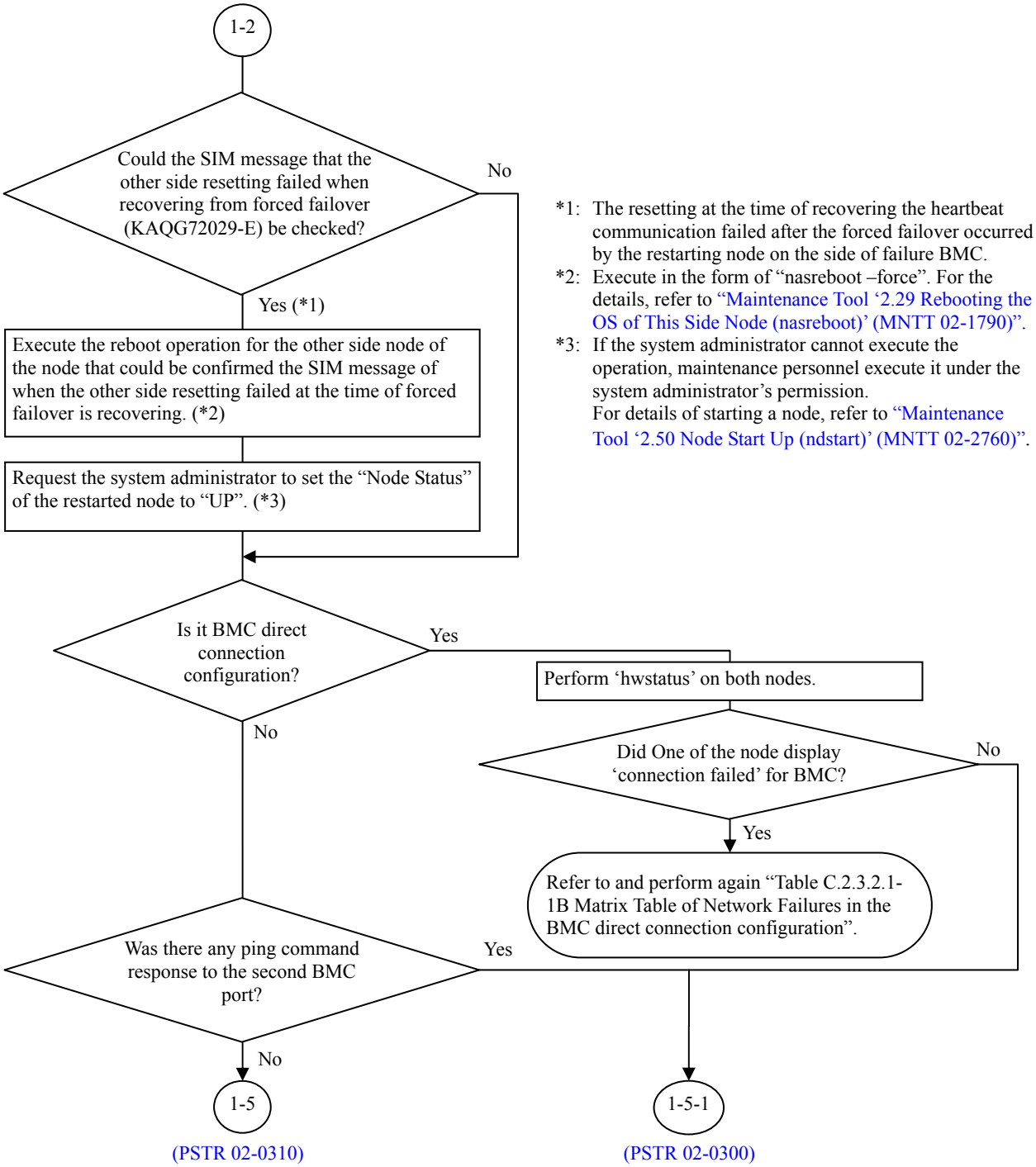

*1: The resetting at the time of recovering the heartbeat communication failed after the forced failover occurred by the restarting node on the side of failure BMC.

*2: Execute in the form of "nasreboot –force". For the details, refer to "Maintenance Tool '2.29 Rebooting the OS of This Side Node (nasreboot)' (MNTT 02-1790)".

*3: If the system administrator cannot execute the operation, maintenance personnel execute it under the system administrator's permission.
For details of starting a node, refer to "Maintenance Tool '2.50 Node Start Up (ndstart)' (MNTT 02-2760)".

Figure C.2.3.2.2-1 Flow of Management Network Failure Determination (4/9)

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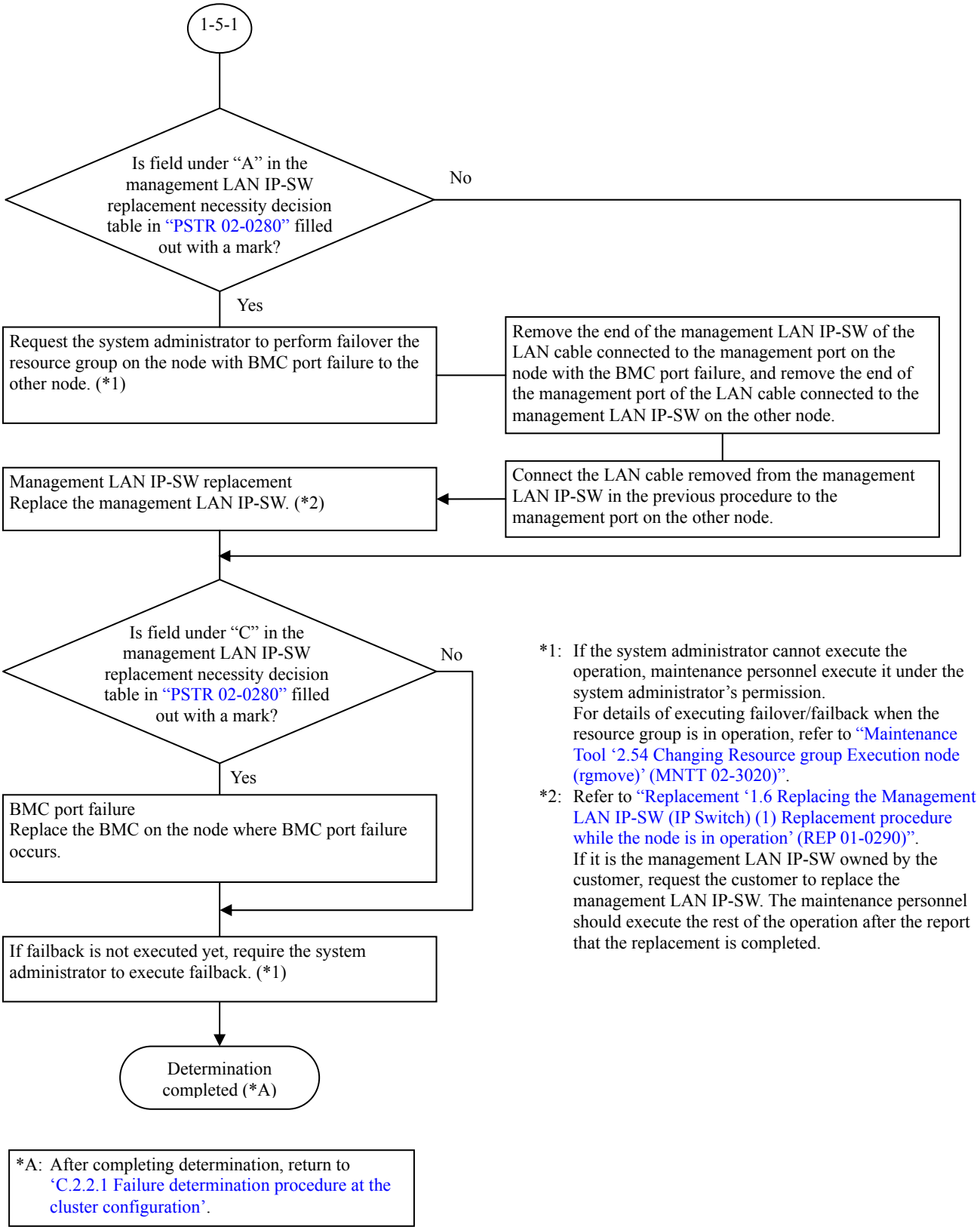

Figure C.2.3.2.2-1 Flow of Management Network Failure Determination (5/9)

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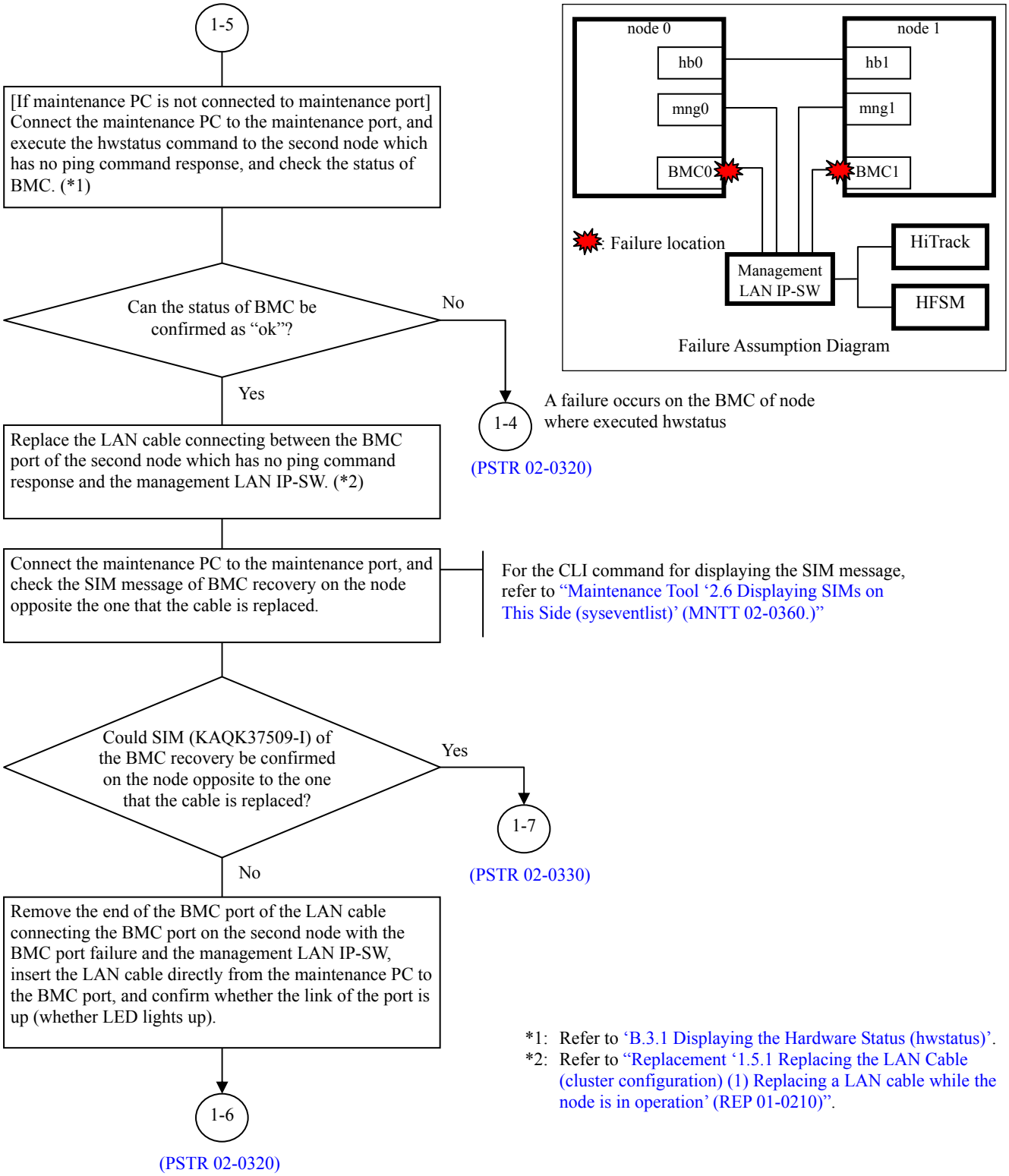

Figure C.2.3.2.2-1 Flow of Management Network Failure Determination (6/9)

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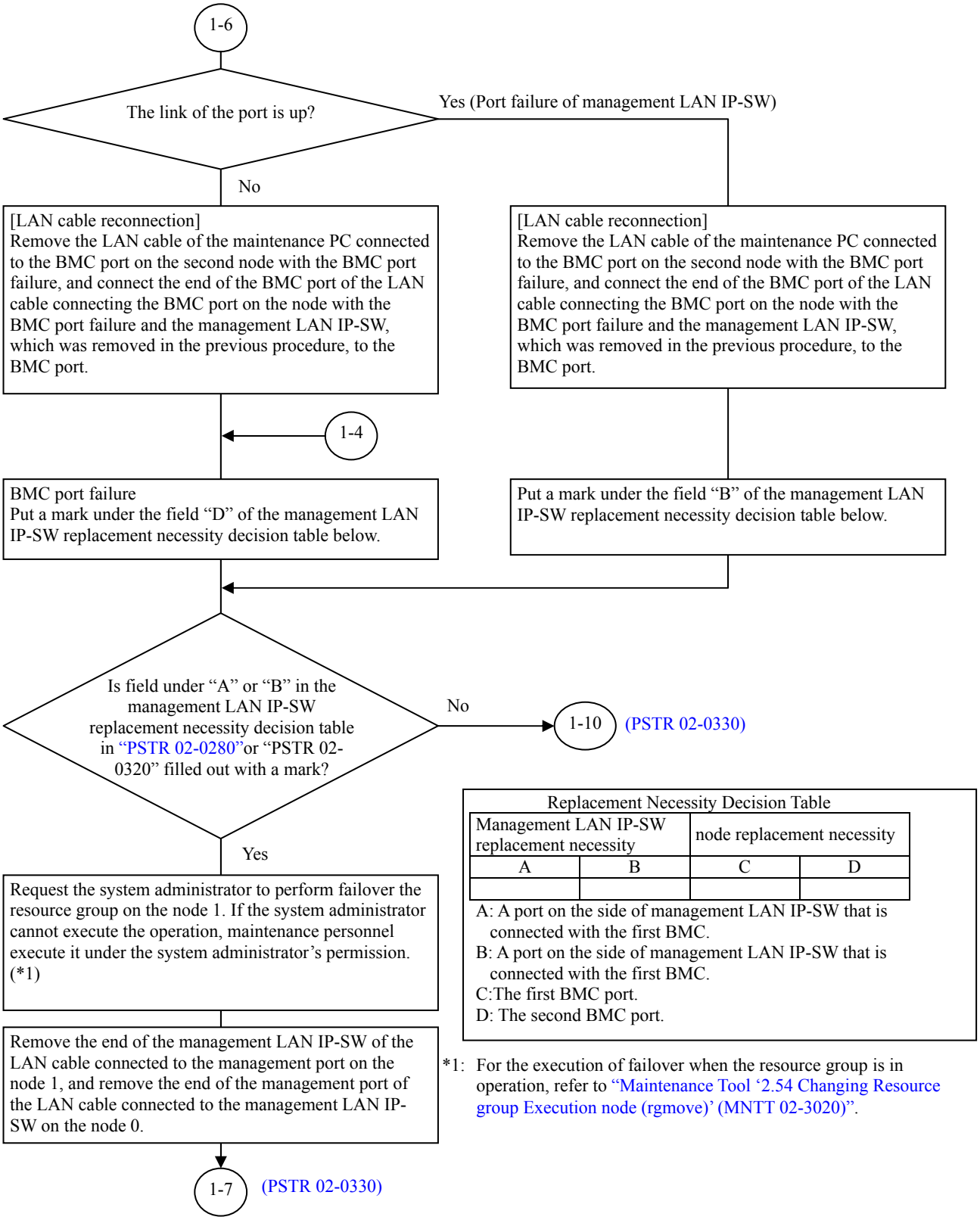

Replacement Necessity Decision Table

Management LAN IP-SW replacement necessity		node replacement necessity	
A	B	C	D

A: A port on the side of management LAN IP-SW that is connected with the first BMC.
B: A port on the side of management LAN IP-SW that is connected with the first BMC.
C:The first BMC port.
D: The second BMC port.

*1: For the execution of failover when the resource group is in operation, refer to "Maintenance Tool '2.54 Changing Resource group Execution node (rgmove)' (MNTT 02-3020)".

Figure C.2.3.2.2-1 Flow of Management Network Failure Determination (7/9)

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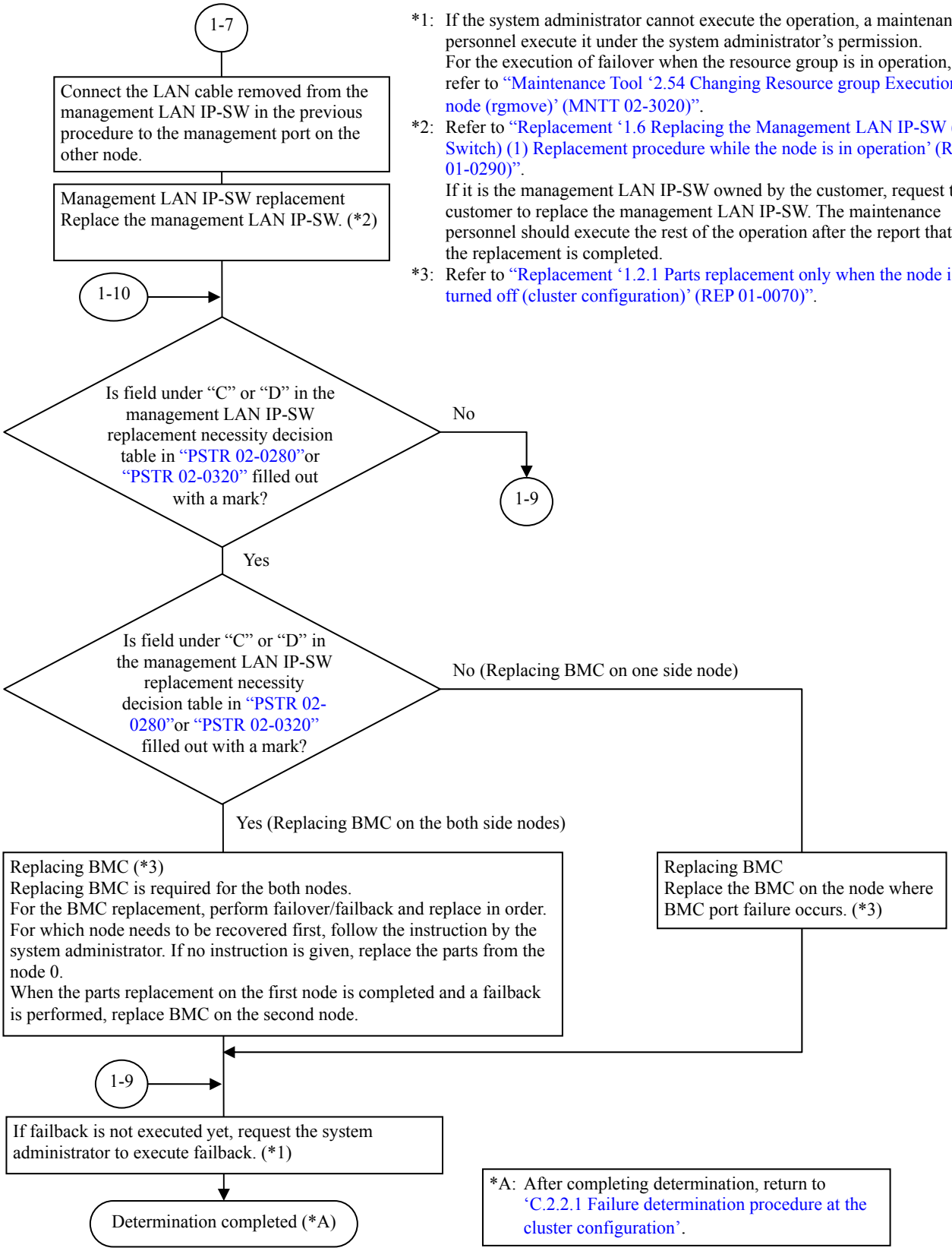

*1: If the system administrator cannot execute the operation, a maintenance personnel execute it under the system administrator's permission.
For the execution of failover when the resource group is in operation, refer to "Maintenance Tool '2.54 Changing Resource group Execution node (rgmove)' (MNTT 02-3020)".

*2: Refer to "Replacement '1.6 Replacing the Management LAN IP-SW (IP Switch) (1) Replacement procedure while the node is in operation' (REP 01-0290)".
If it is the management LAN IP-SW owned by the customer, request the customer to replace the management LAN IP-SW. The maintenance personnel should execute the rest of the operation after the report that the replacement is completed.

*3: Refer to "Replacement '1.2.1 Parts replacement only when the node is turned off (cluster configuration)' (REP 01-0070)".

*A: After completing determination, return to 'C.2.2.1 Failure determination procedure at the cluster configuration'.

Figure C.2.3.2.2-1 Flow of Management Network Failure Determination (8/9)

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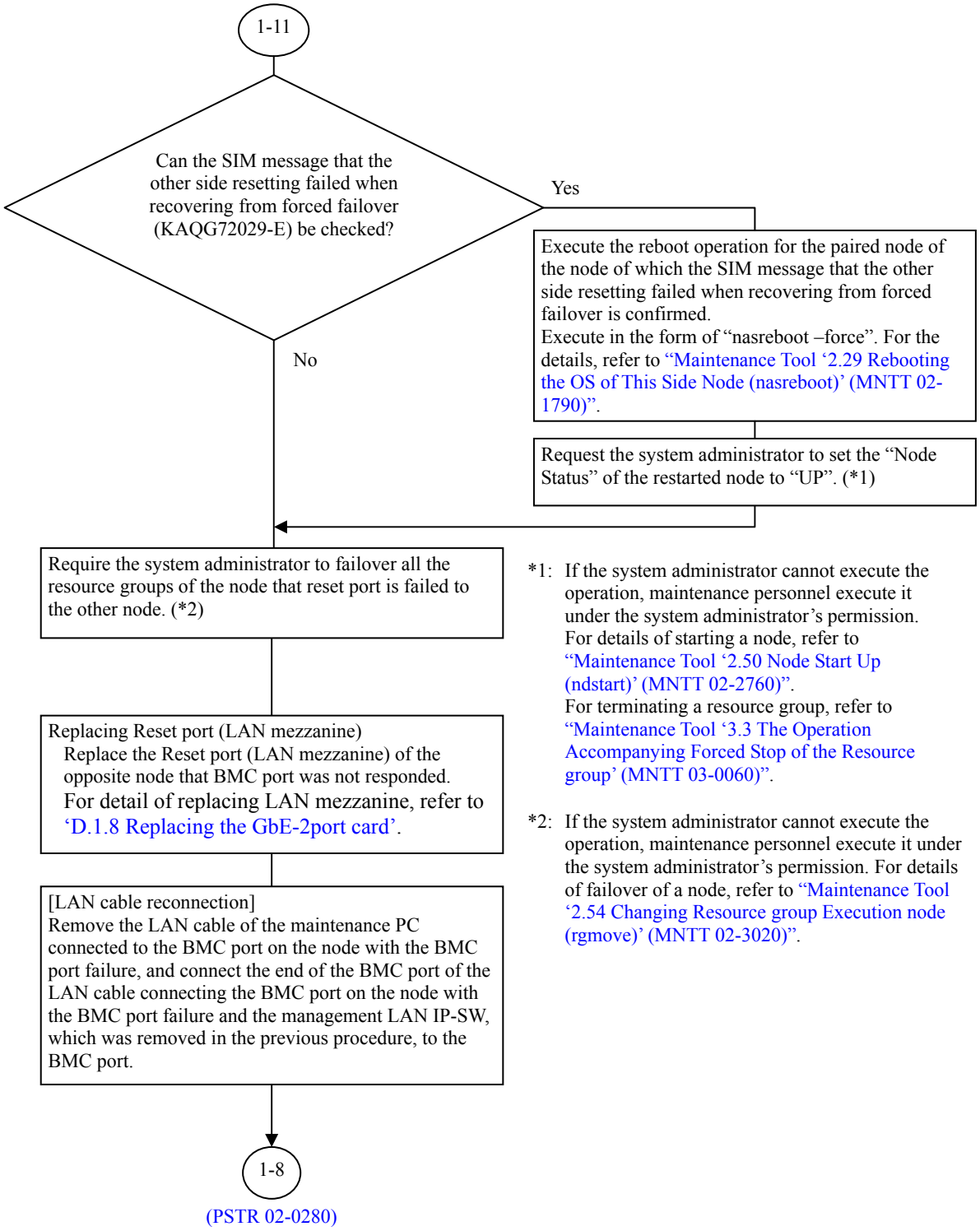

Figure C.2.3.2.2-1 Flow of Management Network Failure Determination (9/9)

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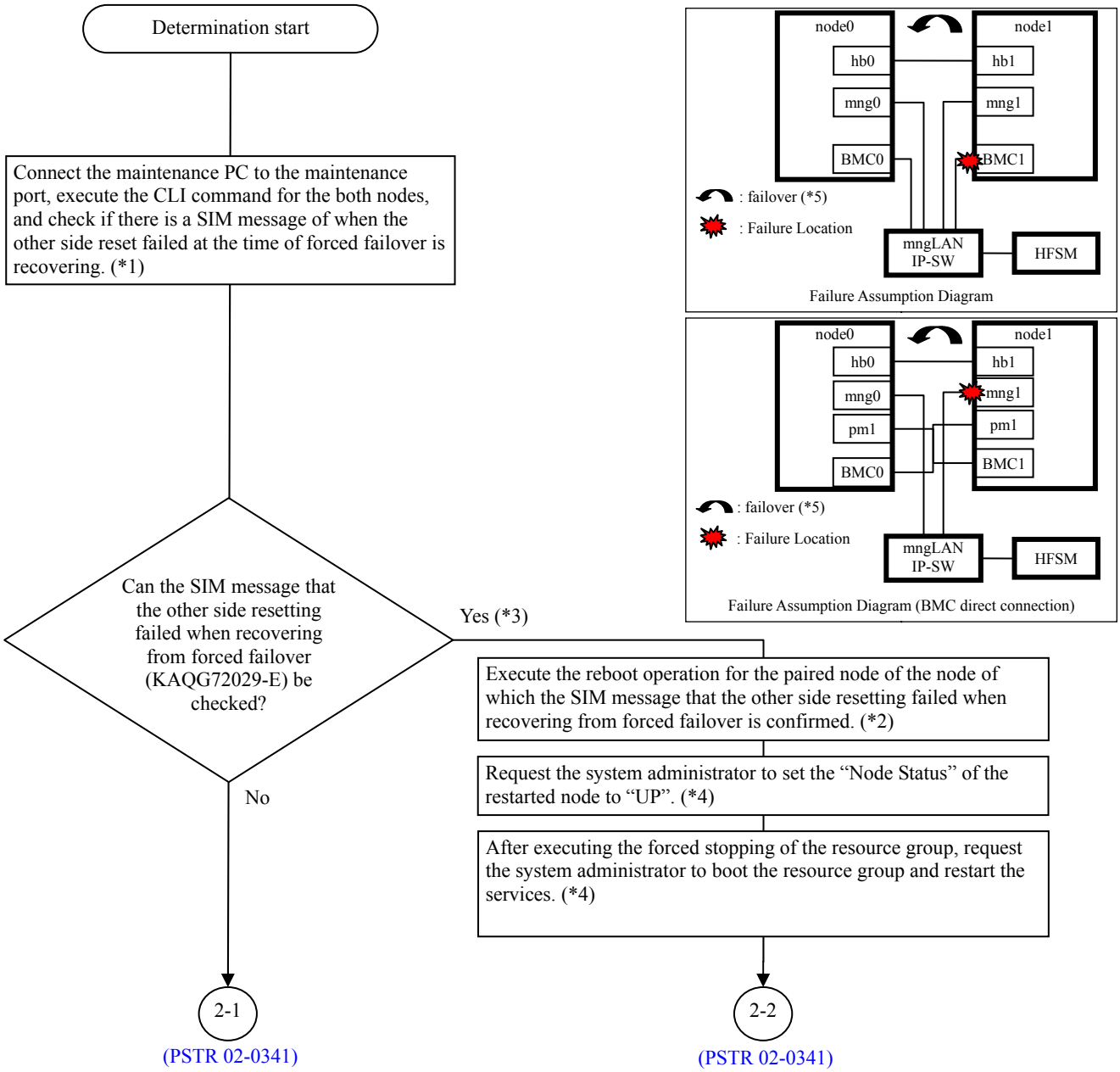
(2) Failure in the management port or the cables



*1: For the CLI command for displaying the SIM messages, refer to "Maintenance Tool '2.6 Displaying SIMs on This Side (syseventlist)' (MNTT 02-0360)".

*2: Execute in the form of "nasreboot –force". For the details, refer to "Maintenance Tool '2.29 Rebooting the OS of This Side Node (nasreboot)' (MNTT 02-1790)".

*3: The resetting at the time of recovering the heartbeat communication failed, after the occurrence of a forced failover by rebooting of node that opposite to the one where a failure occurred on the maintenance port. [srmd executable error] is displayed on the error status of a resource group.

*4: If the system administrator cannot execute the operation, maintenance personnel execute it under the system administrator's permission. For details of starting a node, refer to "Maintenance Tool '2.50 Node Start Up (ndstart)' (MNTT 02-2760)". For terminating a resource group, refer to "Maintenance Tool '3.3 The Operation Accompanying Forced Stop of the Resource group' (MNTT 03-0060)".

*5: In some cases of management port / cable failure, failover might not be occurred.

Figure C.2.3.2.2-2 Flow of Management Network Failure Determination (1/3)

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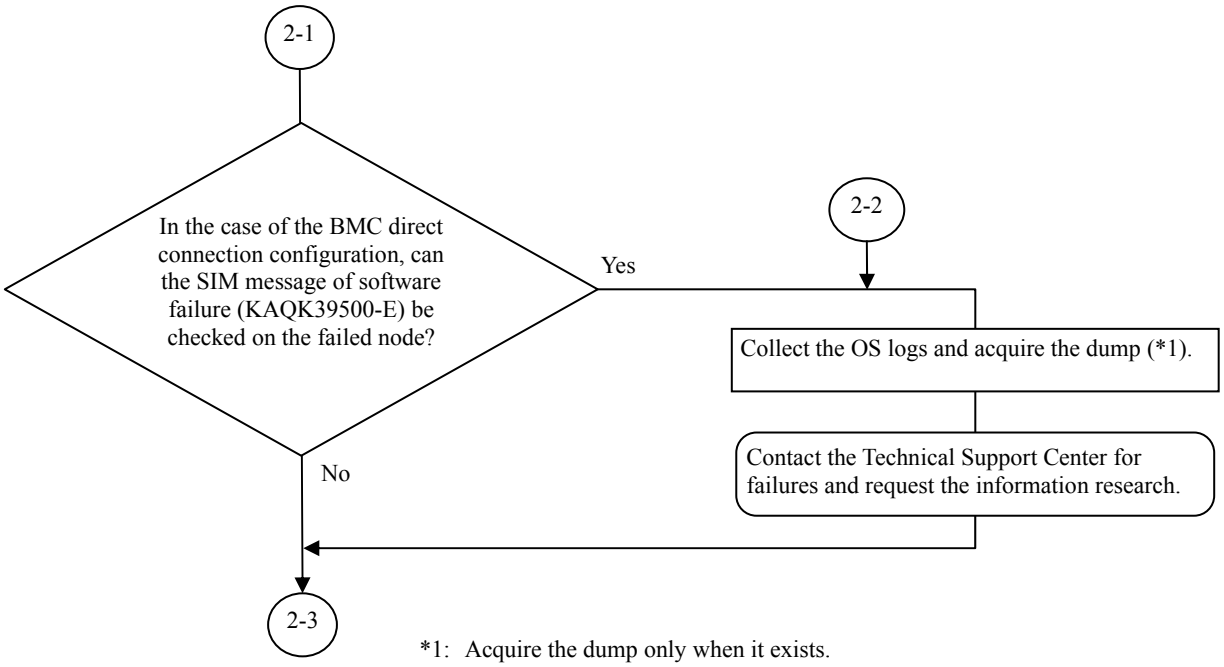

(PSTR 02-0350)

*1: Acquire the dump only when it exists.
For acquiring the log, refer to "Troubleshooting '6.1.1 Acquiring log files' (TRBL 06-0000)".
For acquiring the dump, refer to "Troubleshooting '6.2.1 Collecting dump files' (TRBL 06-0010)".

Figure C.2.3.2.2-2 Flow of Management Network Failure Determination (2/3)

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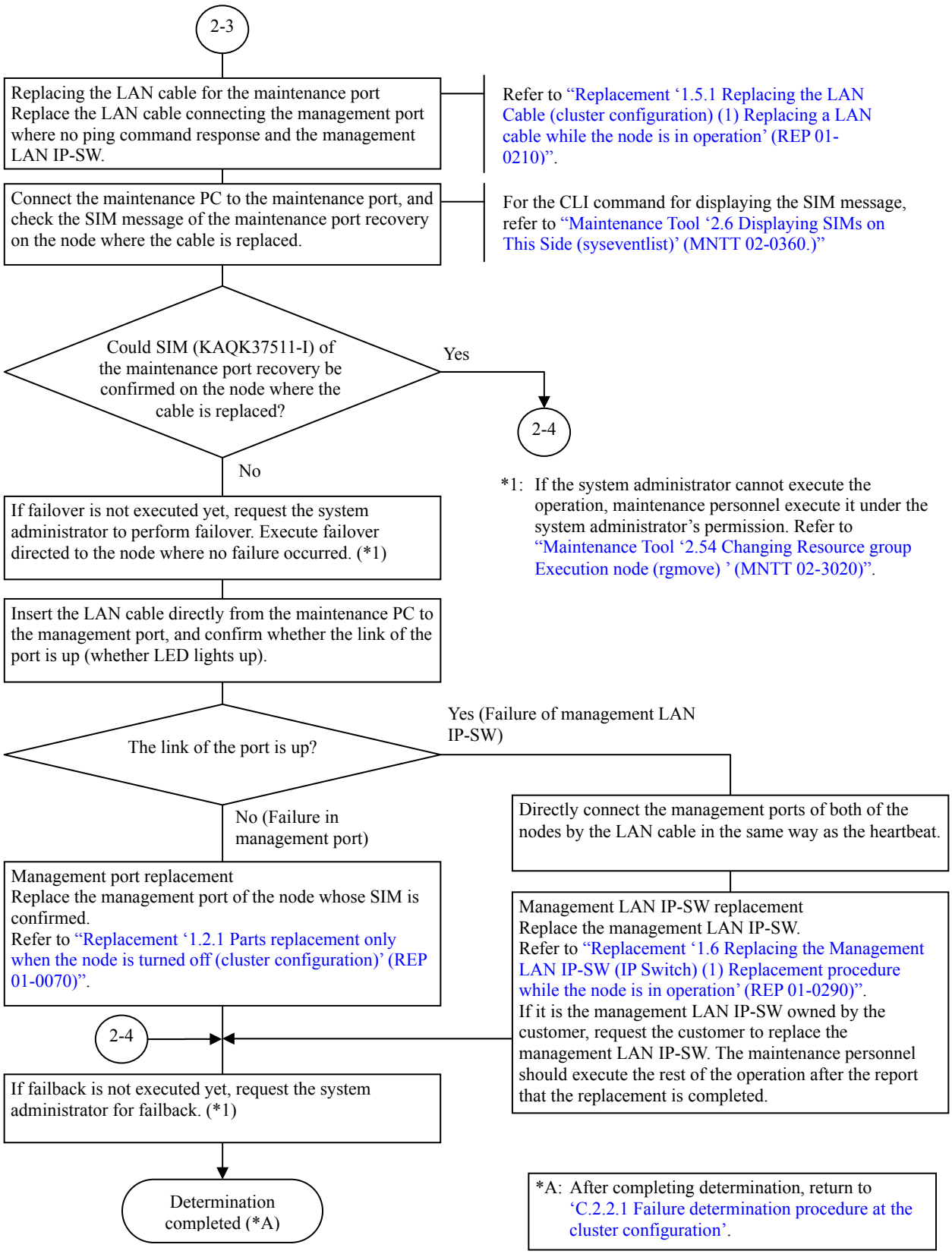

Figure C.2.3.2.2-2 Flow of Management Network Failure Determination (3/3)

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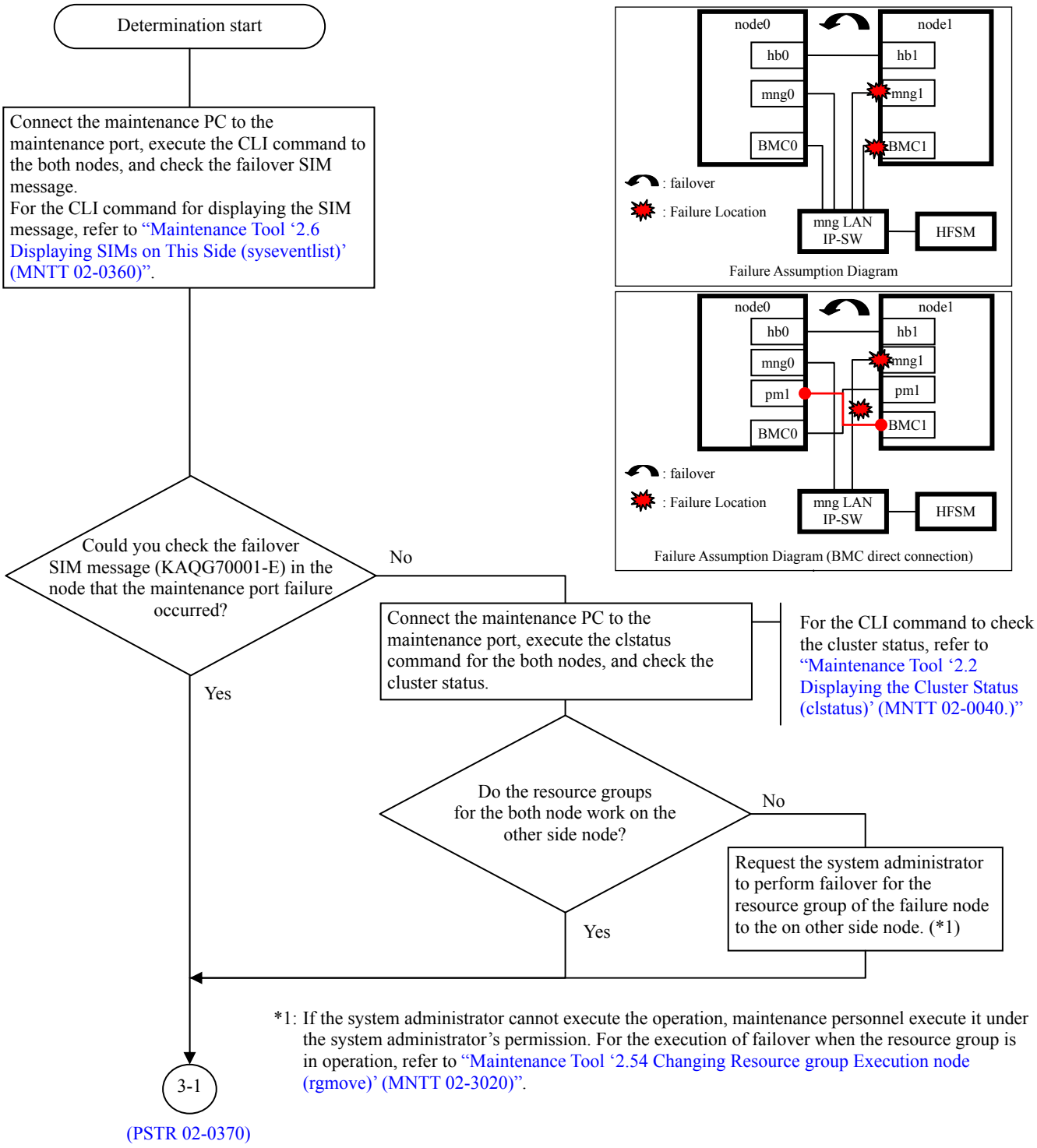
(3) Double failures in the port or cable



*1: If the system administrator cannot execute the operation, maintenance personnel execute it under the system administrator's permission. For the execution of failover when the resource group is in operation, refer to "Maintenance Tool '2.54 Changing Resource group Execution node (rgmove)' (MNTT 02-3020)".

Figure C.2.3.2.2-3 Flow of Management Network Failure Determination (1/7)

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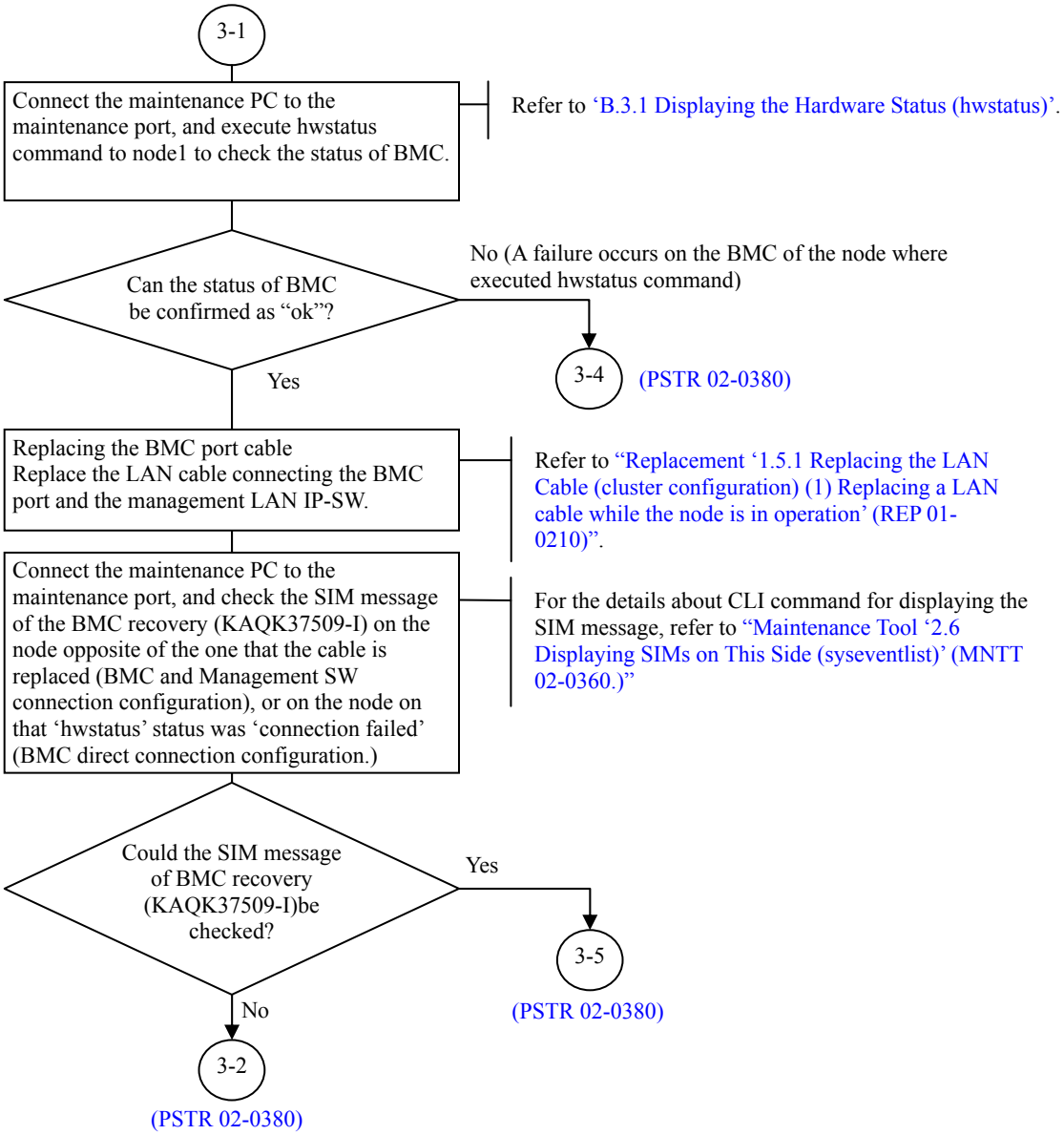

Figure C.2.3.2.2-3 Flow of Management Network Failure Determination (2/7)

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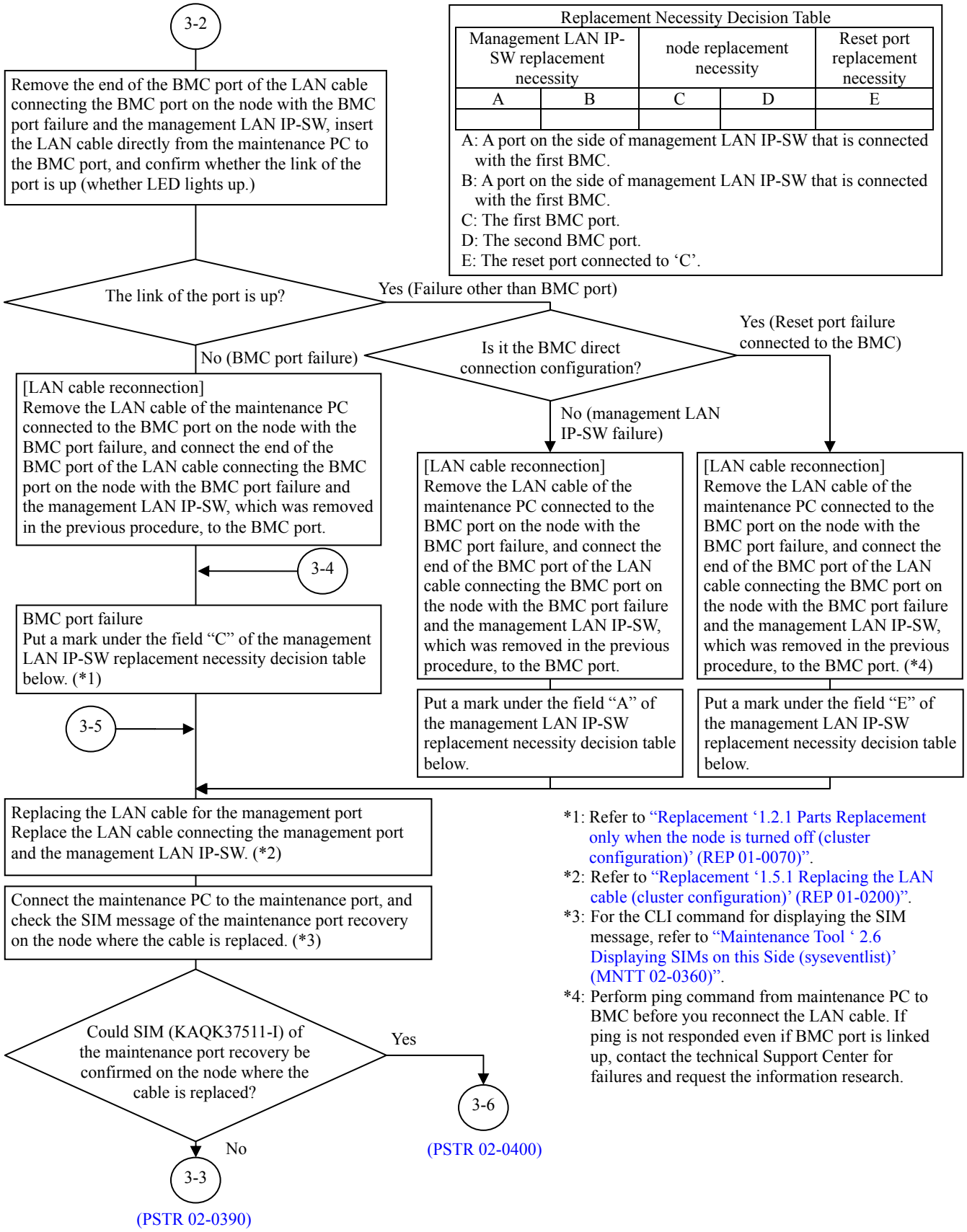

Replacement Necessity Decision Table

Management LAN IP-SW replacement necessity		node replacement necessity		Reset port replacement necessity
A	B	C	D	E

A: A port on the side of management LAN IP-SW that is connected with the first BMC.
B: A port on the side of management LAN IP-SW that is connected with the first BMC.
C: The first BMC port.
D: The second BMC port.
E: The reset port connected to 'C'.

*1: Refer to "Replacement '1.2.1 Parts Replacement only when the node is turned off (cluster configuration)' (REP 01-0070)".
*2: Refer to "Replacement '1.5.1 Replacing the LAN cable (cluster configuration)' (REP 01-0200)".
*3: For the CLI command for displaying the SIM message, refer to "Maintenance Tool ' 2.6 Displaying SIMs on this Side (syseventlist)' (MNTT 02-0360)".
*4: Perform ping command from maintenance PC to BMC before you reconnect the LAN cable. If ping is not responded even if BMC port is linked up, contact the technical Support Center for failures and request the information research.

Figure C.2.3.2.2-3 Flow of Management Network Failure Determination (3/7)

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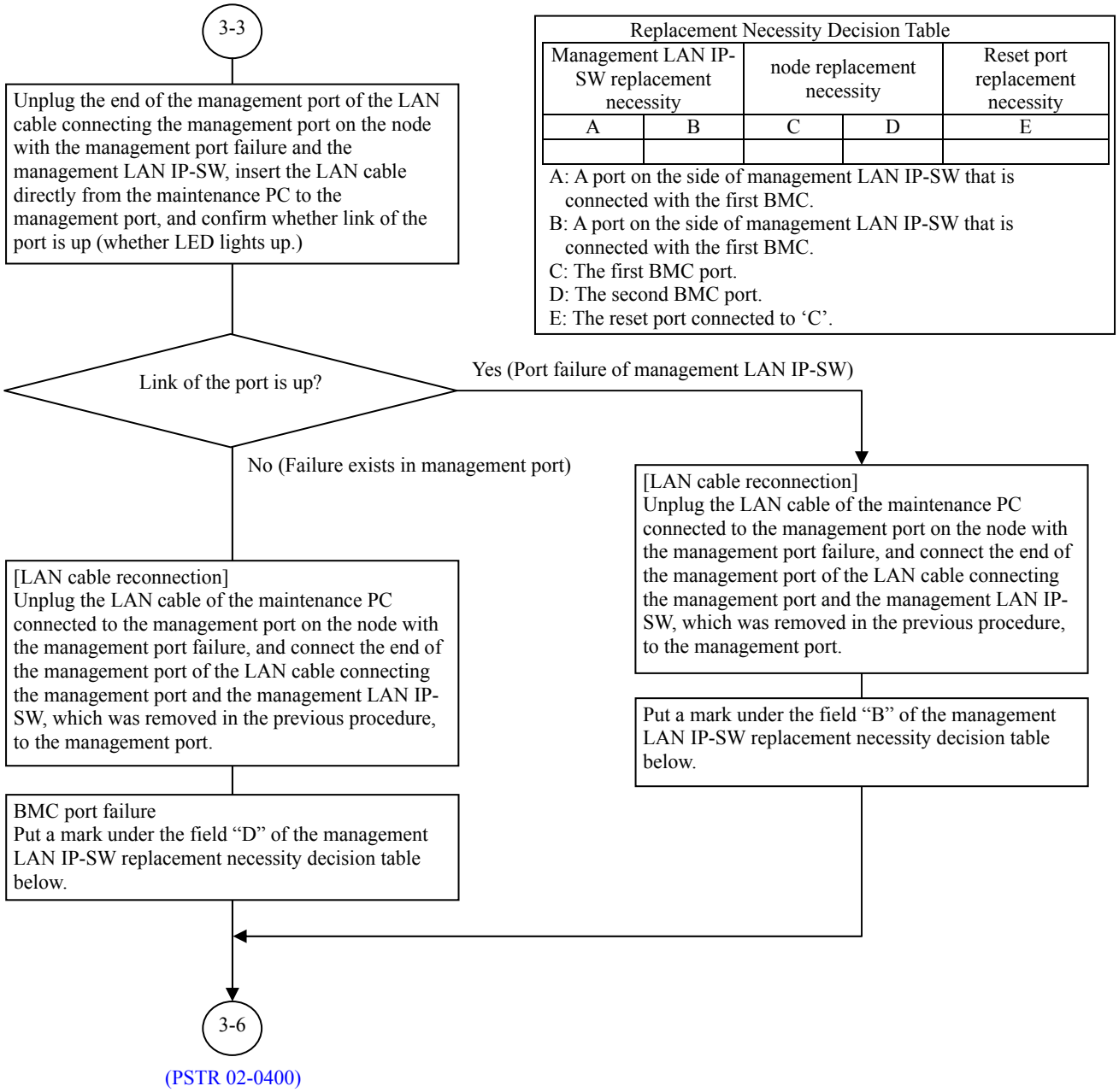

Replacement Necessity Decision Table

Management LAN IP-SW replacement necessity		node replacement necessity		Reset port replacement necessity
A	B	C	D	E

A: A port on the side of management LAN IP-SW that is connected with the first BMC.
B: A port on the side of management LAN IP-SW that is connected with the first BMC.
C: The first BMC port.
D: The second BMC port.
E: The reset port connected to 'C'.

Figure C.2.3.2.2-3 Flow of Management Network Failure Determination (4/7)

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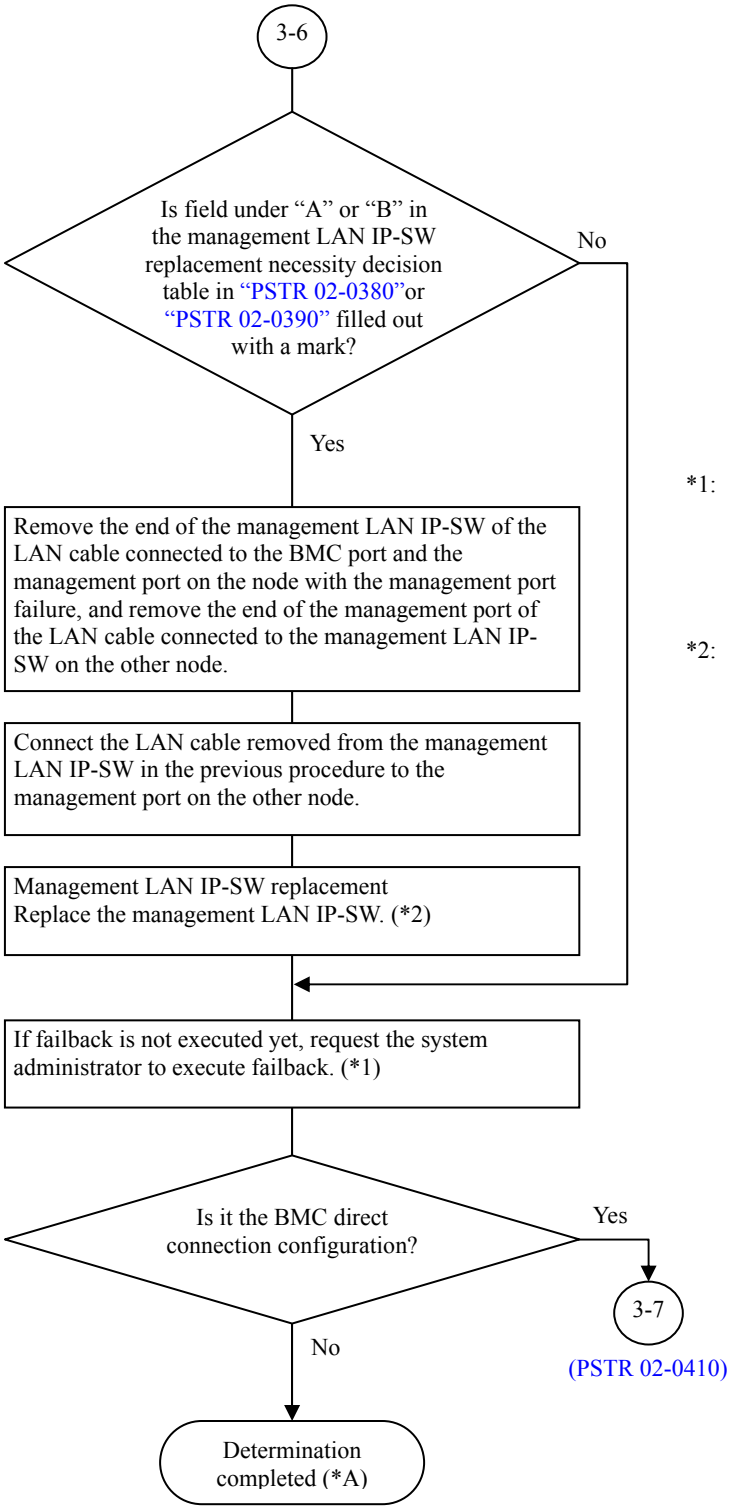

*1: If the system administrator cannot execute the operation, maintenance personnel execute it under the system administrator's permission. For the execution of failover when the resource group is in operation, refer to "Maintenance Tool '2.54 Changing Resource group Execution node (rgmove)' (MNTT 02-3020)".

*2: Refer to "Replacement '1.6 Replacing the Management LAN IP-SW (IP Switch) (1) Replacement procedure while the node is in operation' (REP 01-0290)".
If it is the management LAN IP-SW owned by the customer, request the customer to replace the management LAN IP-SW. The maintenance personnel should execute the rest of the operation after the report that the replacement is completed.

*A: After completing determination, return to 'C.2.2.1 Failure determination procedure at the cluster configuration'.

Figure C.2.3.2.2-3 Flow of Management Network Failure Determination (5/7)

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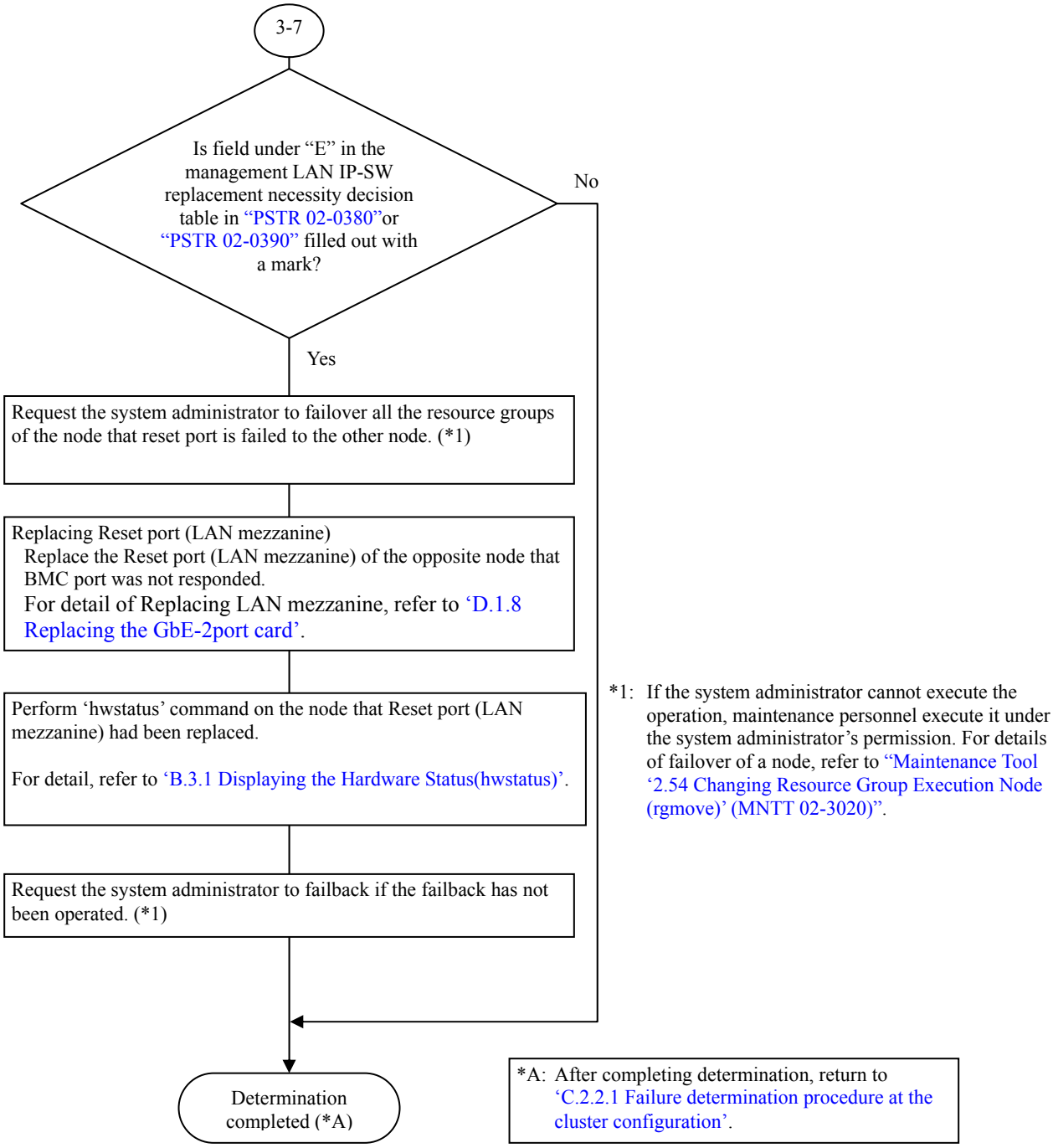

Figure C.2.3.2.2-3 Flow of Management Network Failure Determination (6/7)

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(4) OS down and the failure in the BMC port on the same node

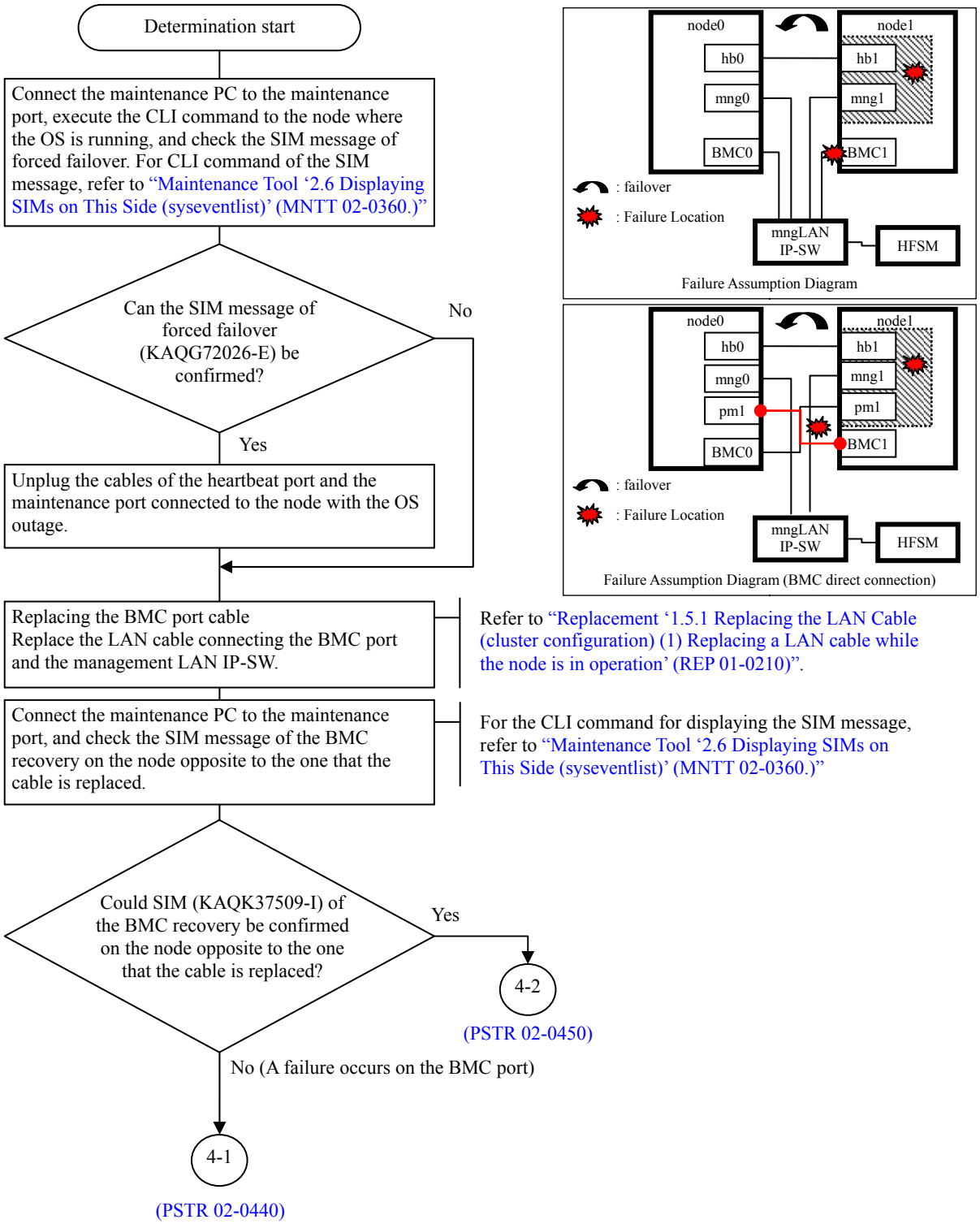

Figure C.2.3.2.2-4 Flow of Management Network Failure Determination (1/7)

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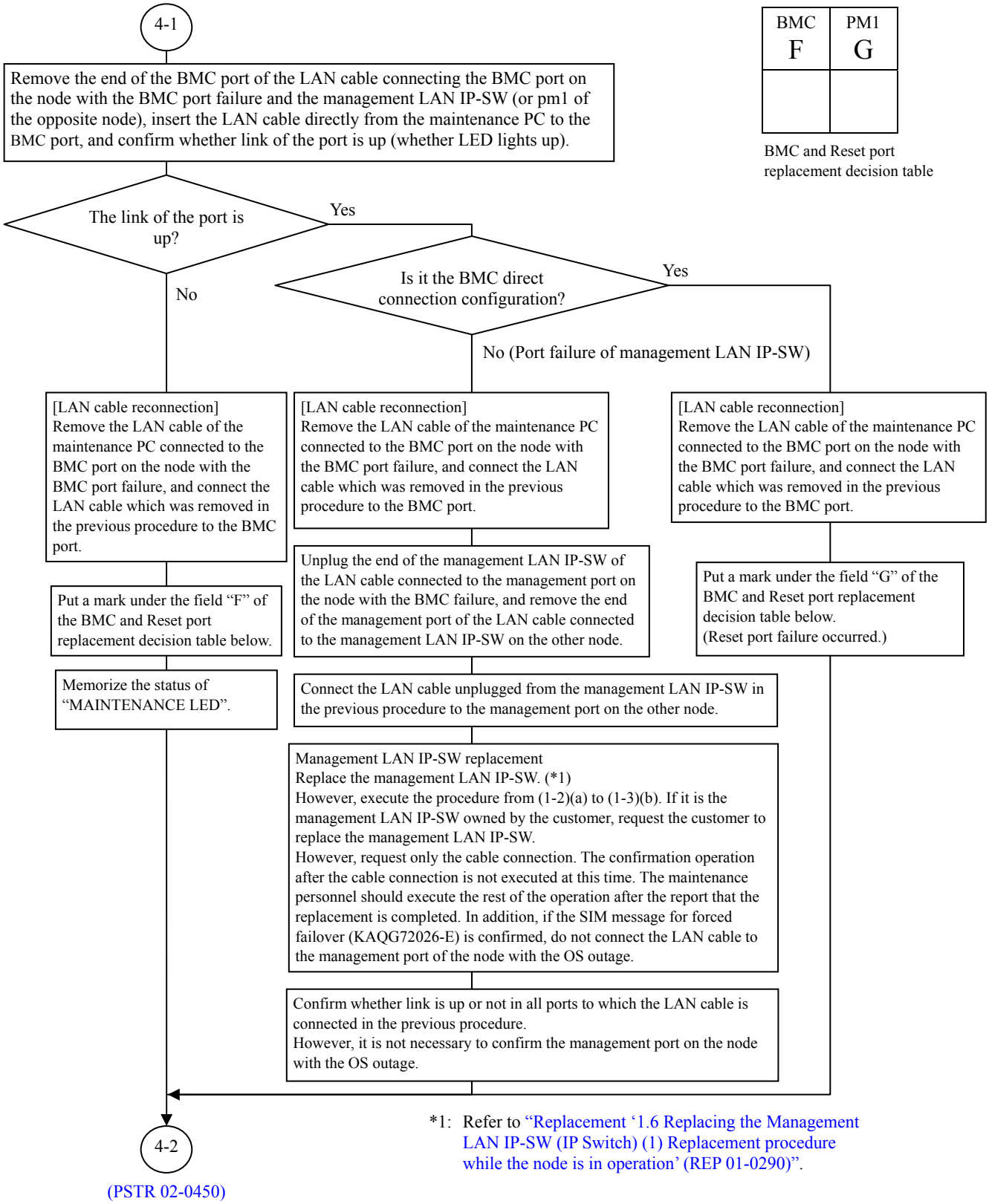

Figure C.2.3.2.2-4 Flow of Management Network Failure Determination (2/7)

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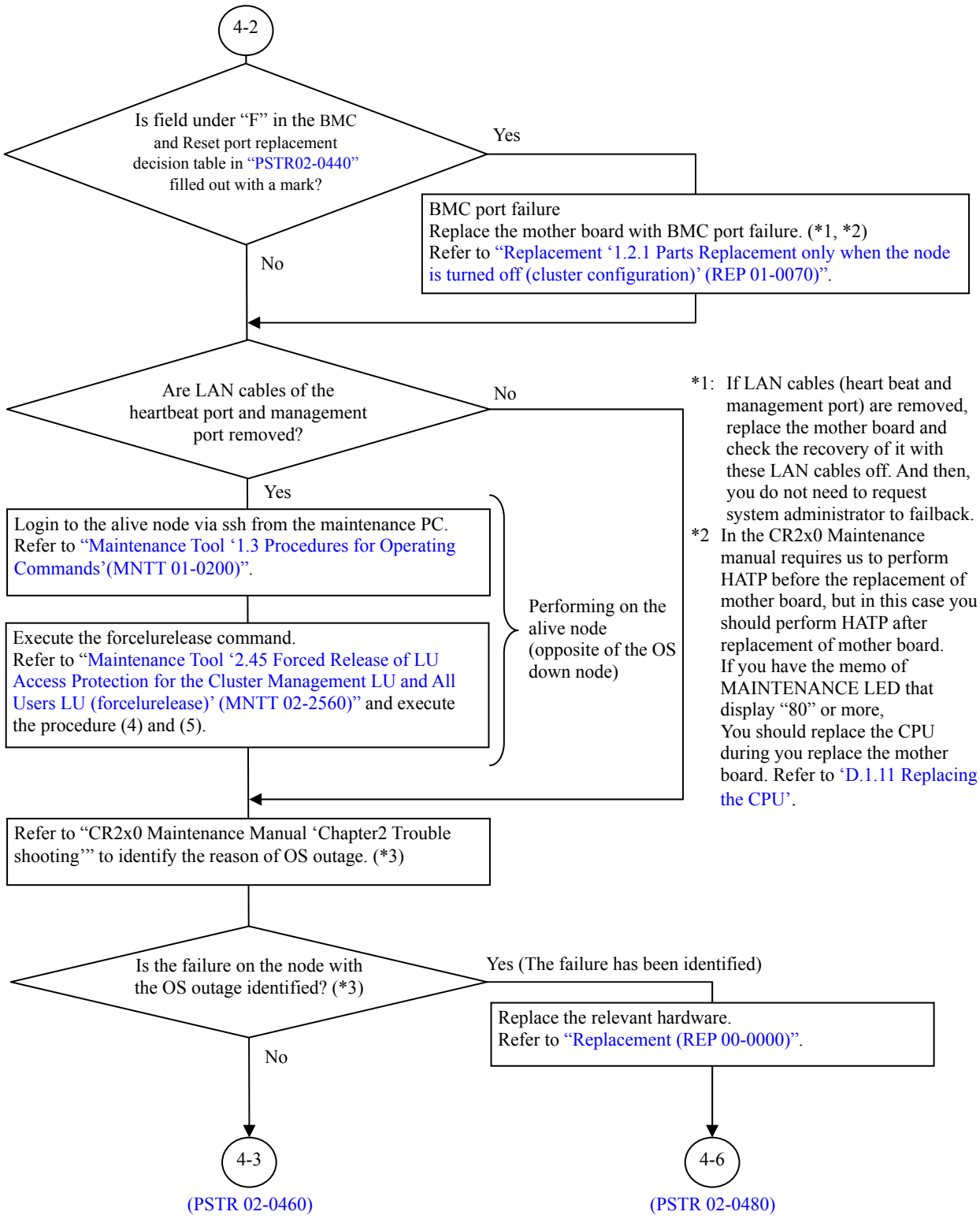

*1: If LAN cables (heart beat and management port) are removed, replace the mother board and check the recovery of it with these LAN cables off. And then, you do not need to request system administrator to failback.

*2 In the CR2x0 Maintenance manual requires us to perform HATP before the replacement of mother board, but in this case you should perform HATP after replacement of mother board. If you have the memo of MAINTENANCE LED that display "80" or more, You should replace the CPU during you replace the mother board. Refer to 'D.1.11 Replacing the CPU'.

*3: When you find the RC (Reference Code) from the HATP result or when you find the parts to be replaced from the MAINTENANCE LED, failure on the node with the OS outage is identified.
In the case HATP finished with no error, the failure has not yet identified.
In the case MAINTENANCE LED is lit "01" but both of internal HDDs are alive, the failure has not yet been identified.
In these cases, some hardware within a chassis might be in failure (e.g. RAID controller).

*4: Before performing hardware replacement, perform the HATP and collect the HATP log.

Figure C.2.3.2.2-4 Flow of Management Network Failure Determination (3/7)

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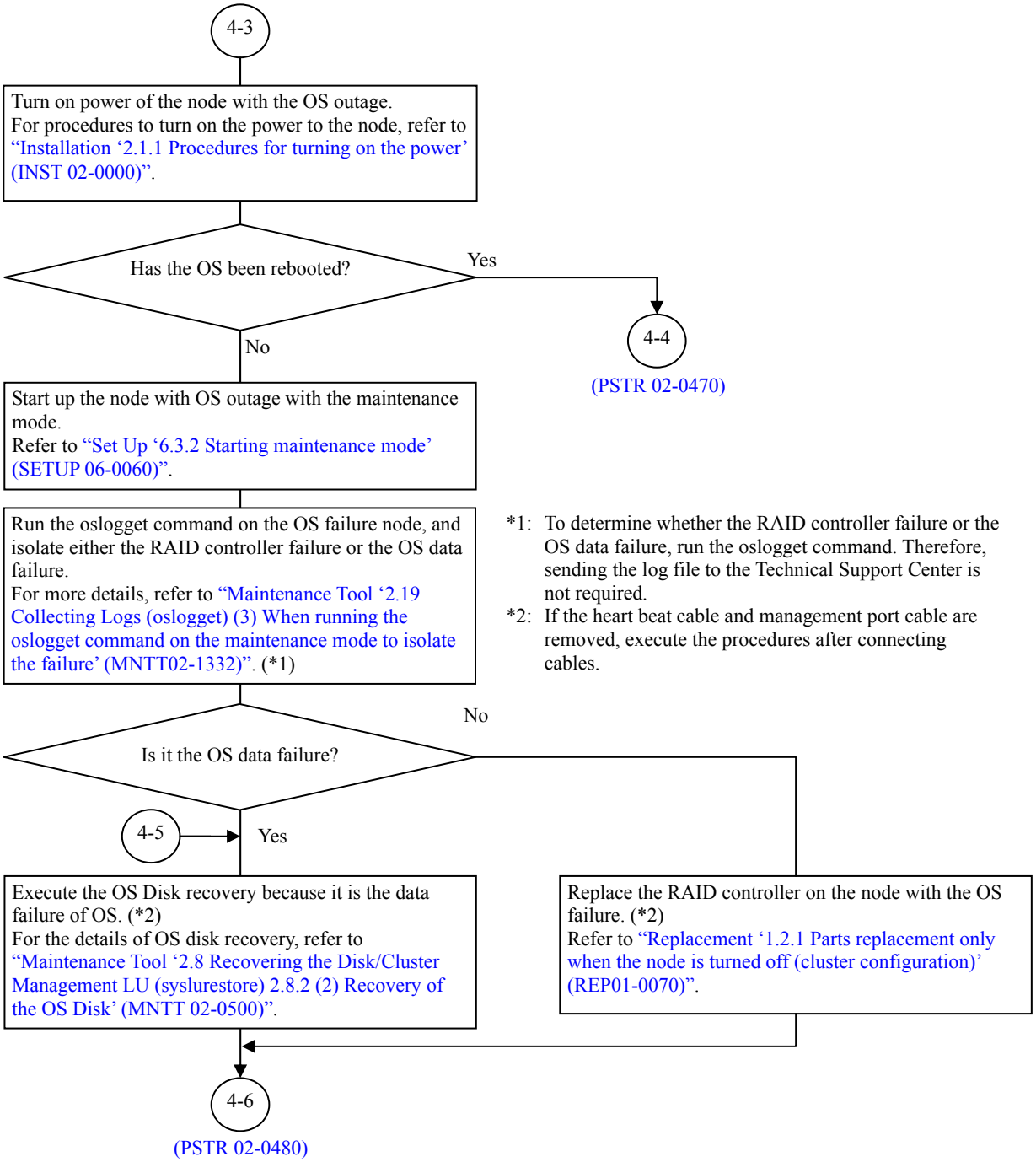

Figure C.2.3.2.2-4 Flow of Management Network Failure Determination (4/7)

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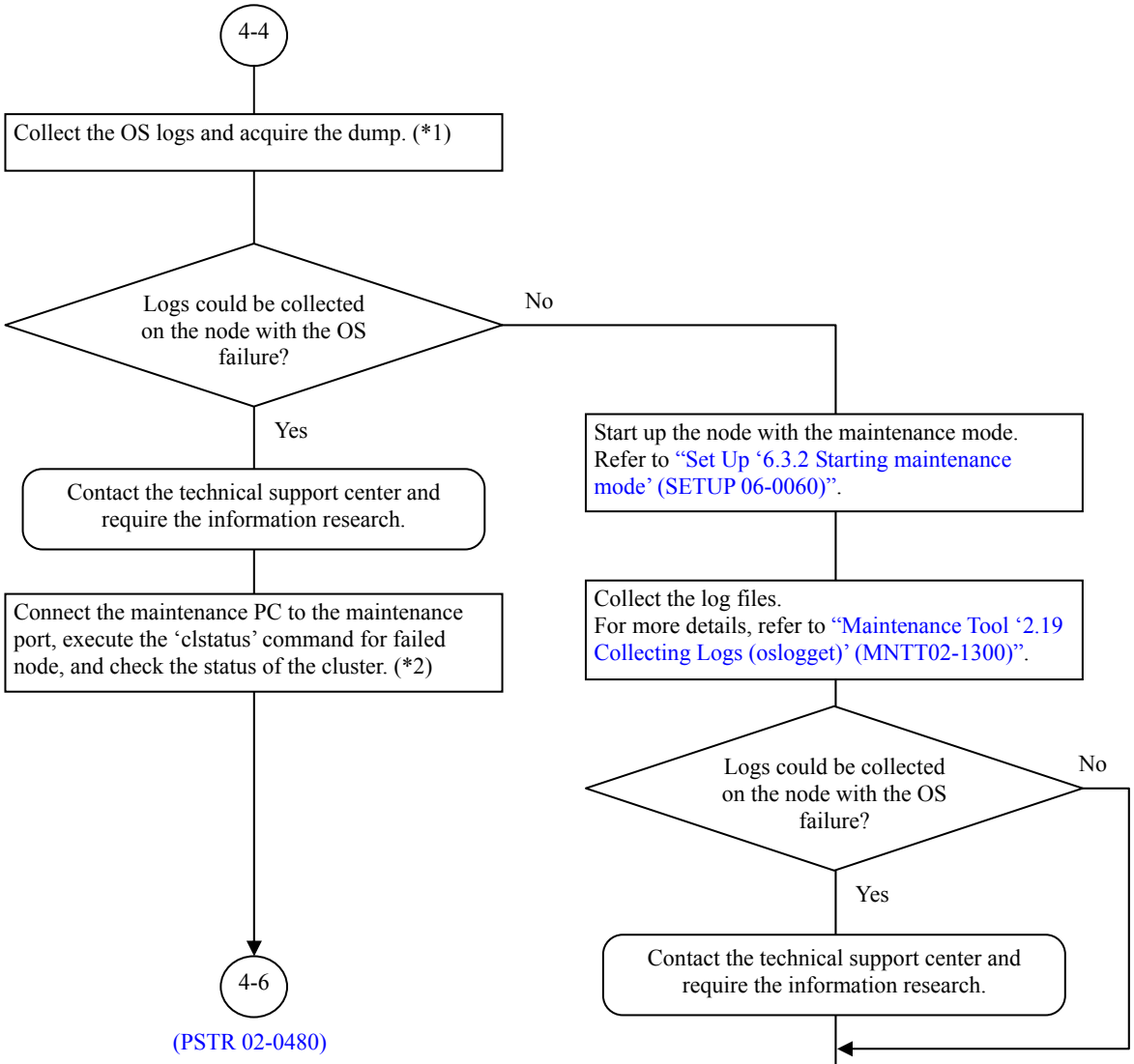

*1: Acquire the dump only when it exists.
For acquiring the log, refer to "Troubleshooting '6.1.1 Acquiring log files' (TRBL 06-0000)".
For acquiring the dump, refer to "Troubleshooting '6.2.1 Collecting dump files' (TRBL 06-0010)".

*2: Refer to "Maintenance Tool '2.2 Displaying the Cluster Status(clstatus)' (MNTT 02-0040)".

Figure C.2.3.2.2-4 Flow of Management Network Failure Determination (5/7)

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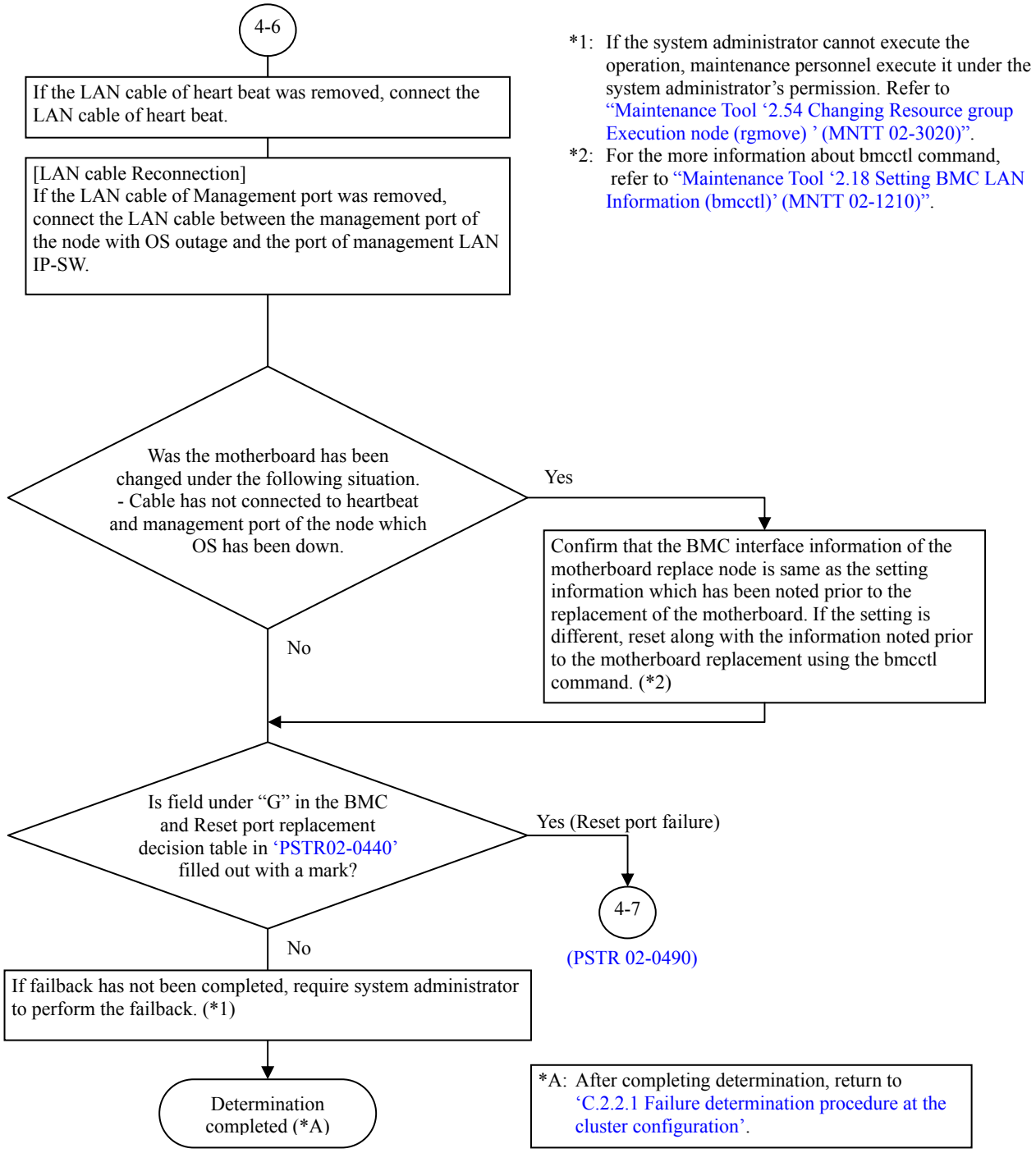

*1: If the system administrator cannot execute the operation, maintenance personnel execute it under the system administrator's permission. Refer to "Maintenance Tool '2.54 Changing Resource group Execution node (rgmove) ' (MNTT 02-3020)".

*2: For the more information about bmcctl command, refer to "Maintenance Tool '2.18 Setting BMC LAN Information (bmcctl)' (MNTT 02-1210)".

Figure C.2.3.2.2-4 Flow of Management Network Failure Determination (6/7)

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4-7

Require the system administrator to failover all the resource groups of the node that reset port is failed to the other node. (*1)

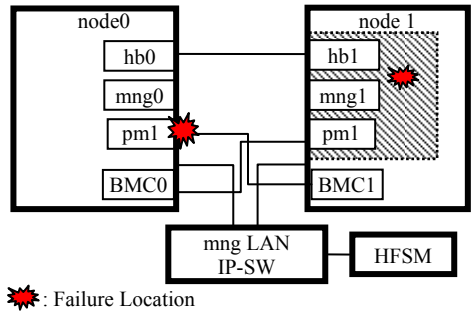
Turn off the power of the node that reset port (LAN mezzanine) will be replaced. (*2)

[Replacing Reset port (LAN mezzanine)]
Replace the Reset port (LAN mezzanine) of the opposite node that BMC port was not responded.
For detail of Replacing LAN mezzanine, refer to 'D.1.8 Replacing the GbE-2port card'.

Turn on power of the node.
For procedures to turn on the power to the node, refer to "Installation '2.1.1 Procedure for turning on the power' (INST 02-0000.)"

If failback has not been completed, require system administrator to perform the failback. (*1)

Determination completed (*A)



Failure Assumption Diagram

*1: If the system administrator cannot execute the operation, maintenance personnel execute it under the system administrator's permission. For details of failover of a node, refer to "Maintenance Tool '2.54 Changing Resource Group Execution Node (rgmove)' (MNTT 02-3020)".

*2: Perform "nasshutdown - -force". For more detail, refer to "Maintenance Tool '2.28 Terminating the OS of This side node (nasshutdown)' (MNTT 02-1740.)"

*A: After completing determination, return to 'C.2.2.1 Failure determination procedure at the cluster configuration'.

Figure C.2.3.2.2-4 Flow of Management Network Failure Determination (7/7)

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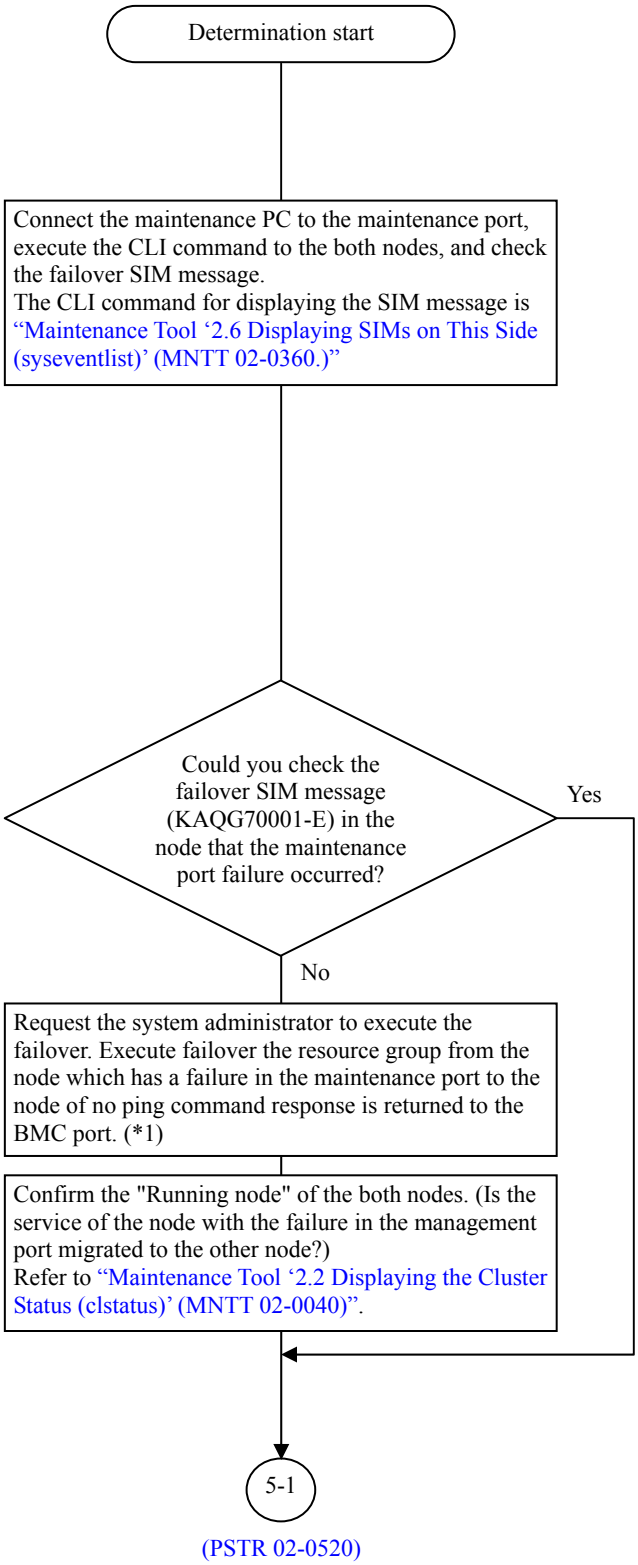
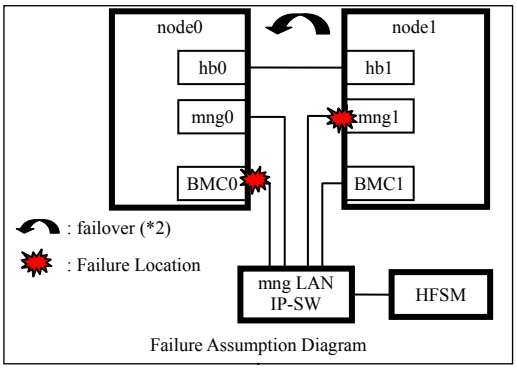
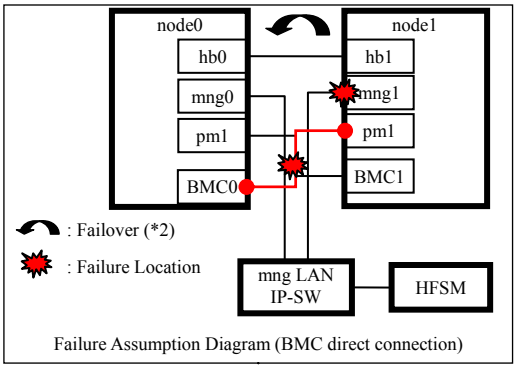
(5) Failure in the BMC port and in the management port of the other node





Failure Assumption Diagram



Failure Assumption Diagram (BMC direct connection)

*1: If the system administrator cannot execute the operation, maintenance personnel execute it under the system administrator's permission. For the execution of failover when the resource group is in operation, refer to "Maintenance Tool '2.54 Changing Resource group Execution node (rgmove)' (MNTT 02-3020)".

2: In the case the management port does not have service IP addresses, failover will not occur.

Figure C.2.3.2.2-5 Flow of Management Network Failure Determination (1/6)

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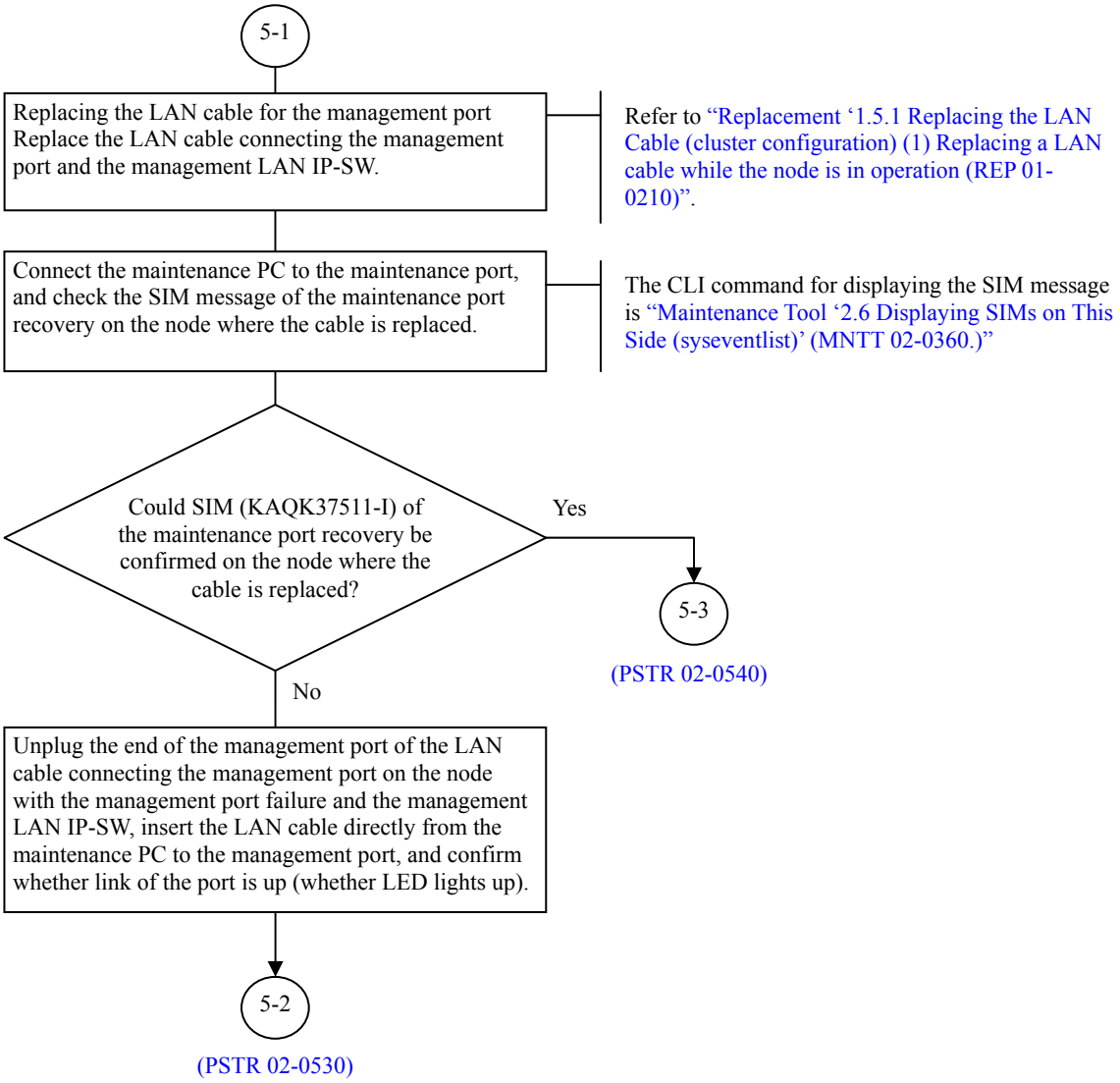

Figure C.2.3.2.2-5 Flow of Management Network Failure Determination (2/6)

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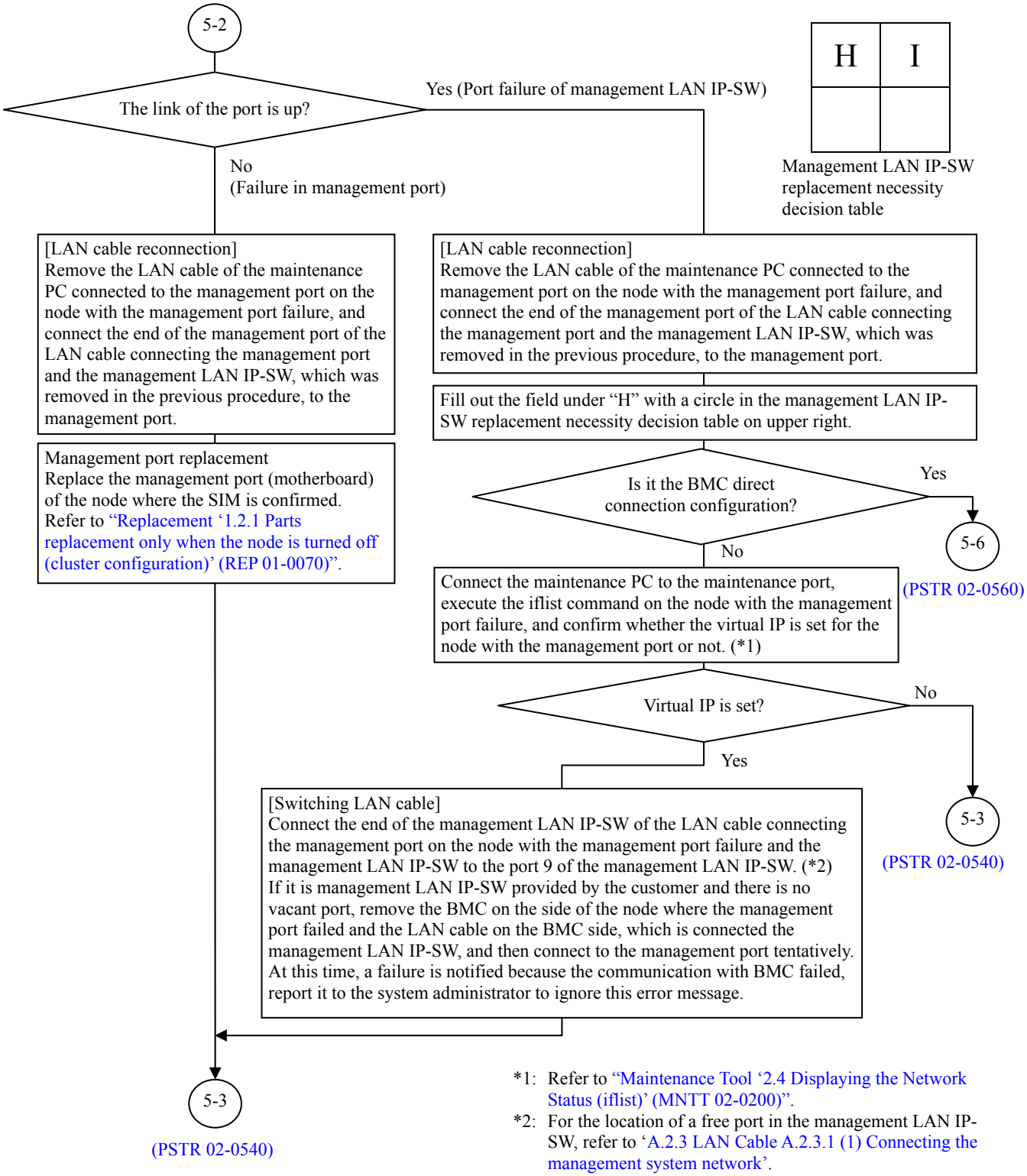

Figure C.2.3.2.2-5 Flow of Management Network Failure Determination (3/6)

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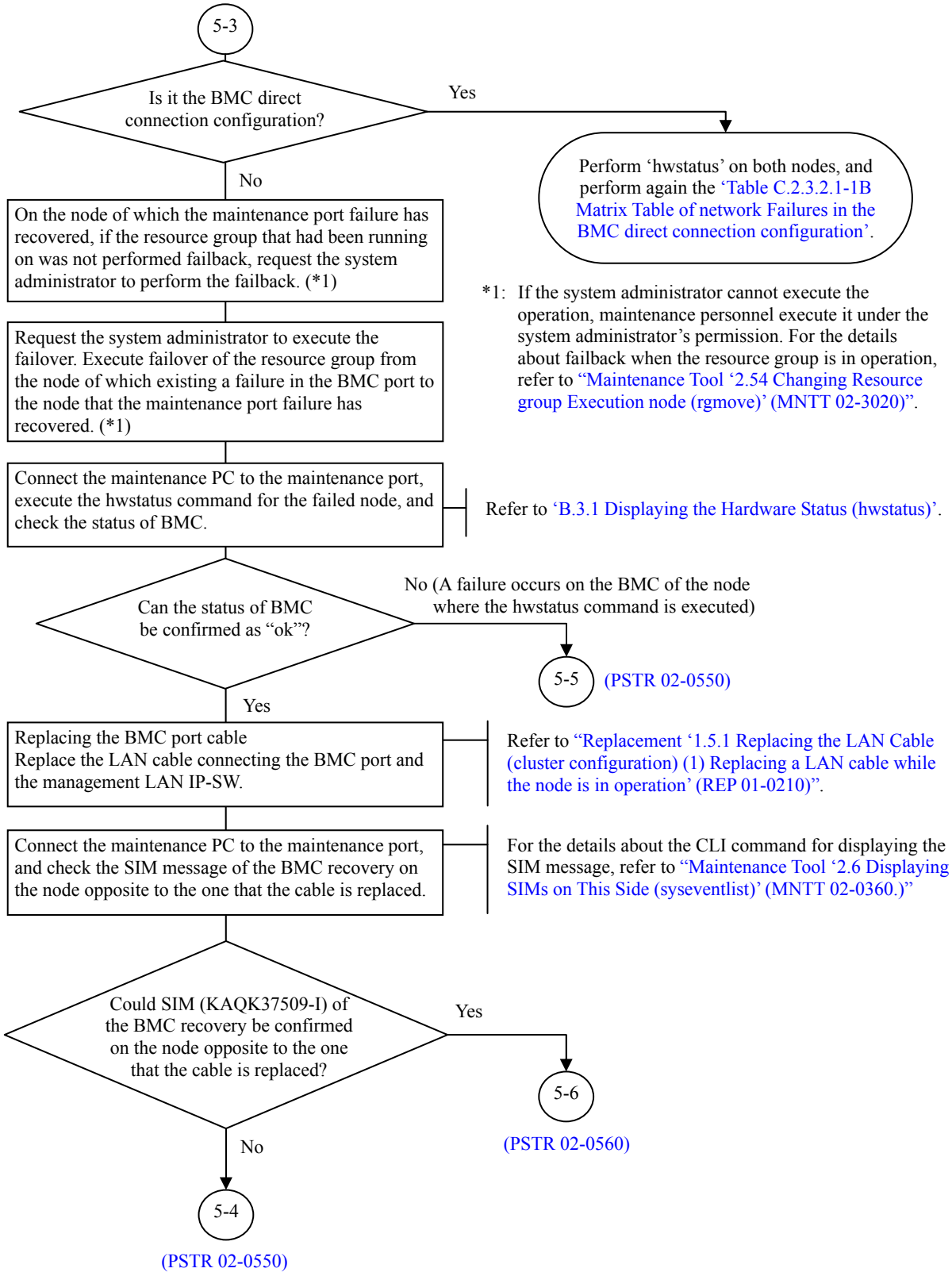

Figure C.2.3.2.2-5 Flow of Management Network Failure Determination (4/6)

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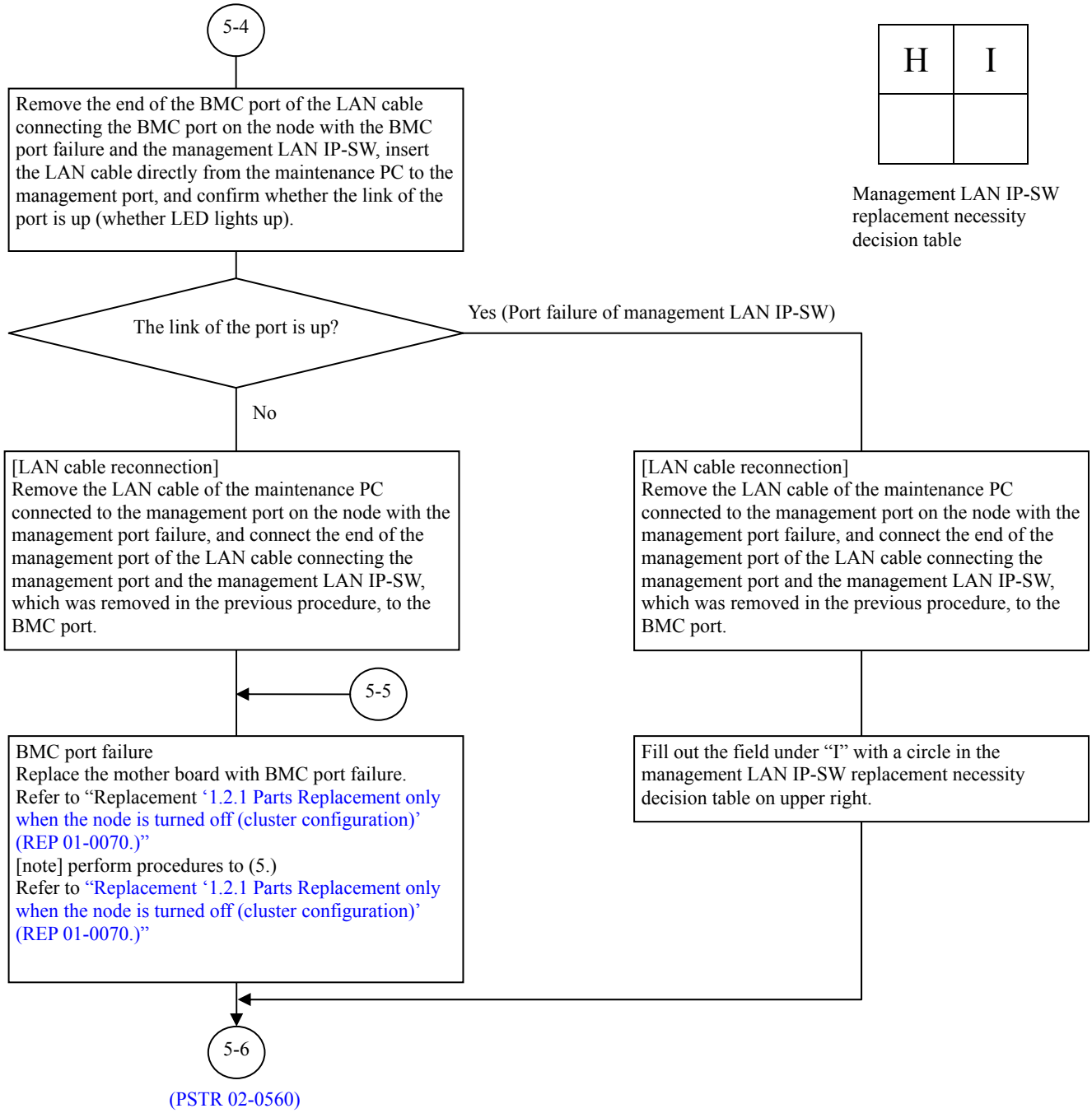

Figure C.2.3.2.2-5 Flow of Management Network Failure Determination (5/6)

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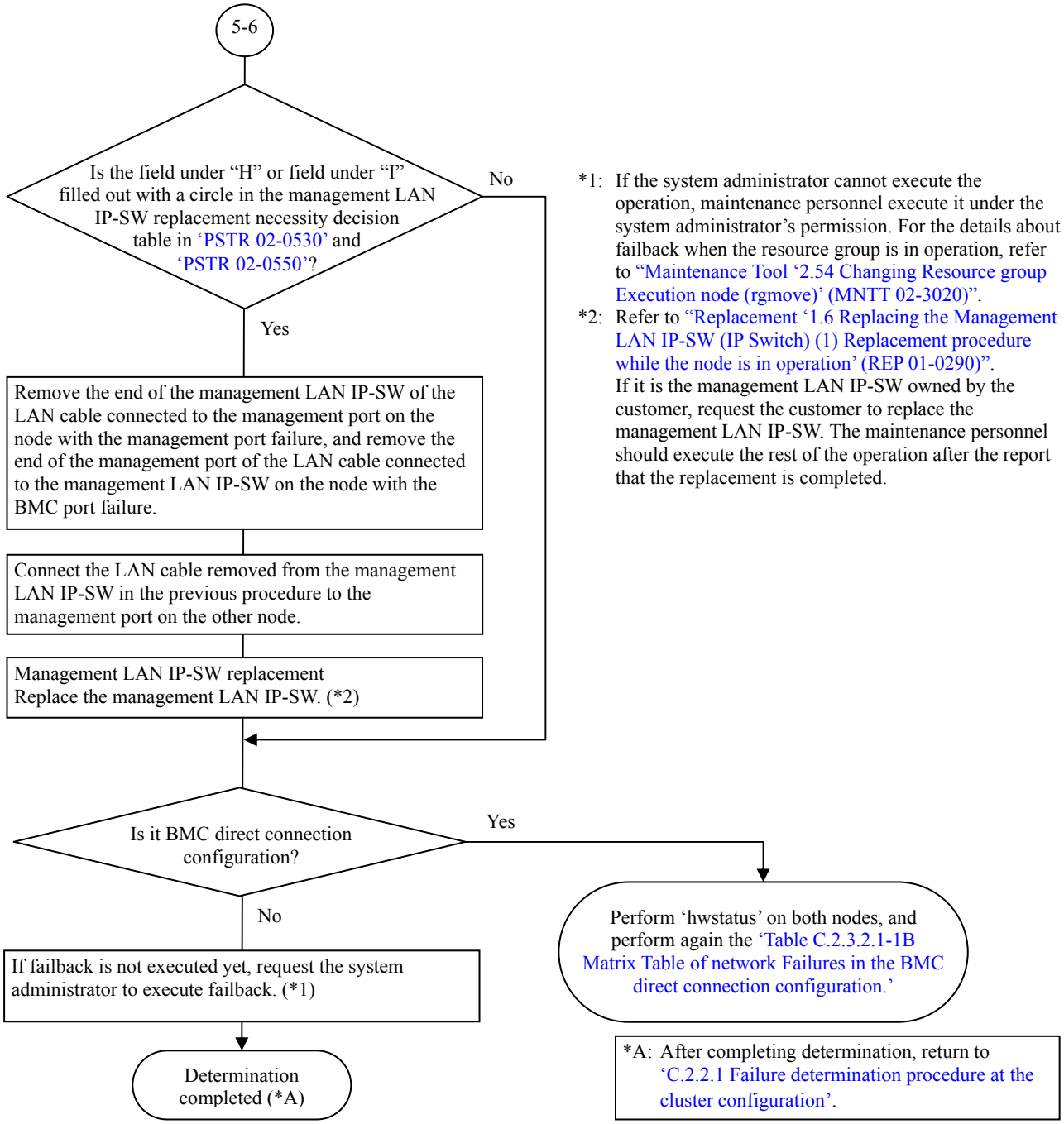

*1: If the system administrator cannot execute the operation, maintenance personnel execute it under the system administrator's permission. For the details about failback when the resource group is in operation, refer to "Maintenance Tool '2.54 Changing Resource group Execution node (rgmove)' (MNTT 02-3020)".

*2: Refer to "Replacement '1.6 Replacing the Management LAN IP-SW (IP Switch) (1) Replacement procedure while the node is in operation' (REP 01-0290)".
If it is the management LAN IP-SW owned by the customer, request the customer to replace the management LAN IP-SW. The maintenance personnel should execute the rest of the operation after the report that the replacement is completed.

Figure C.2.3.2.2-5 Flow of Management Network Failure Determination (6/6)

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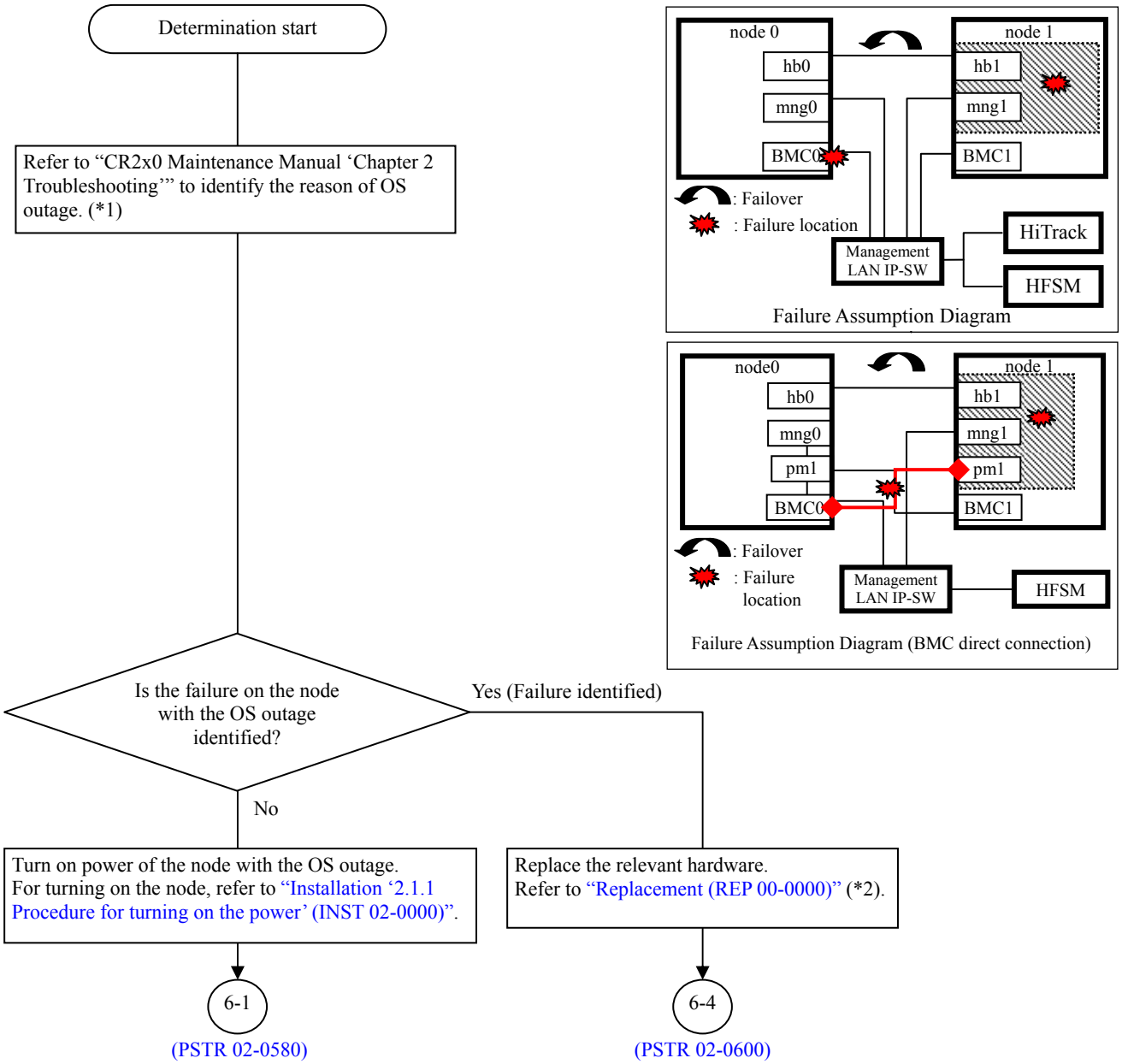
(6) OS down and a failure in the BMC port of the other node



*1: When you find the RC (Reference Code) from the HATP result or when you find the parts to be replaced from the MAINTENANCE LED, failure on the node with the OS outage is identified.
In the case HATP finished with no error, the failure has not yet identified.
In the case MAINTENANCE LED is lit "01" but both of internal HDDs are alive, the failure has not yet been identified.
In these cases, some hardware within a chassis might be in failure (e.g. RAID controller).

*2: Make sure to collect Simple log by using HATP before the parts replacement.

Figure C.2.3.2.2-6 Flow of Management Network Failure Determination (1/6)

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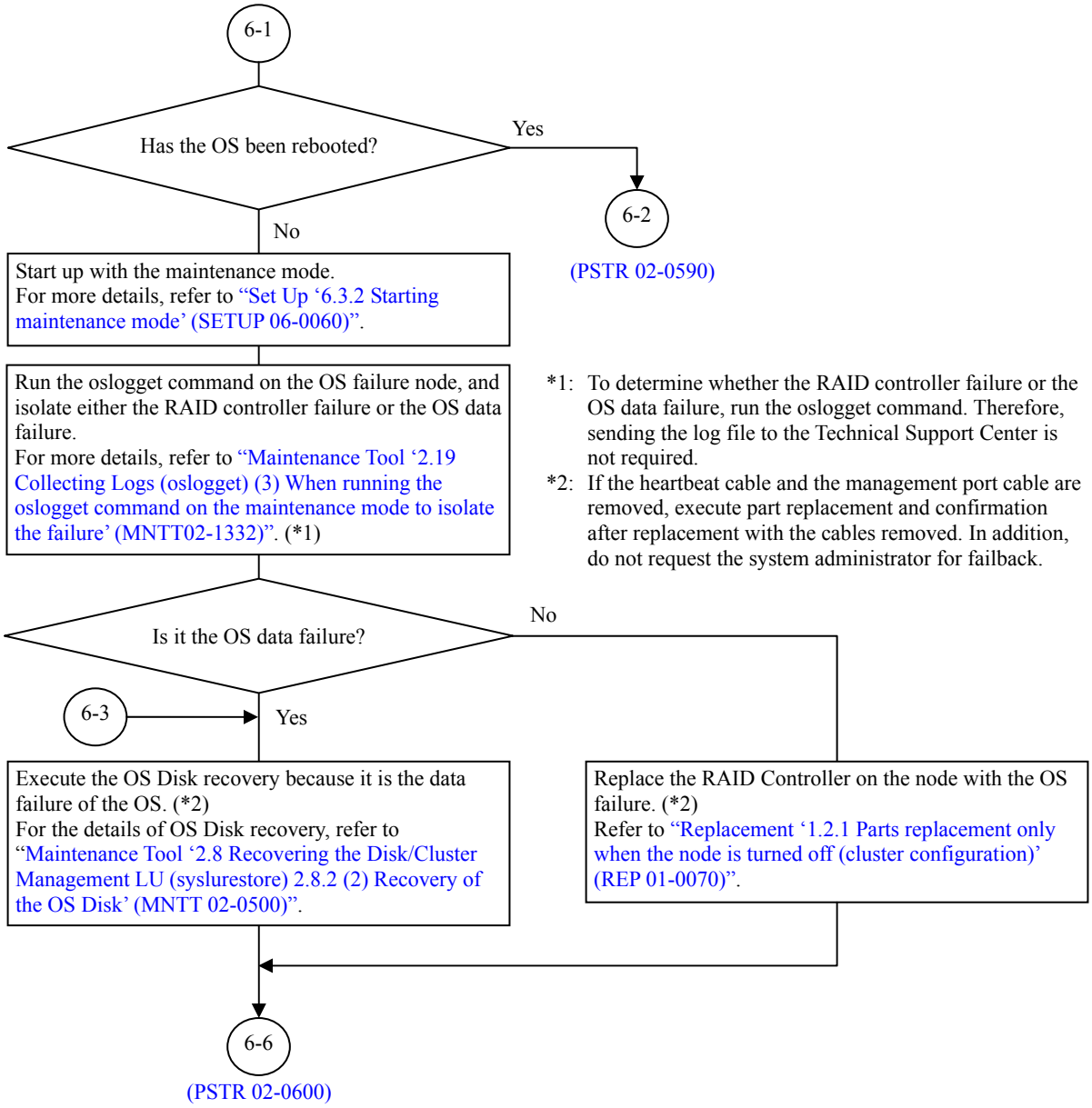

Figure C.2.3.2.2-6 Flow of Management Network Failure Determination (2/6)

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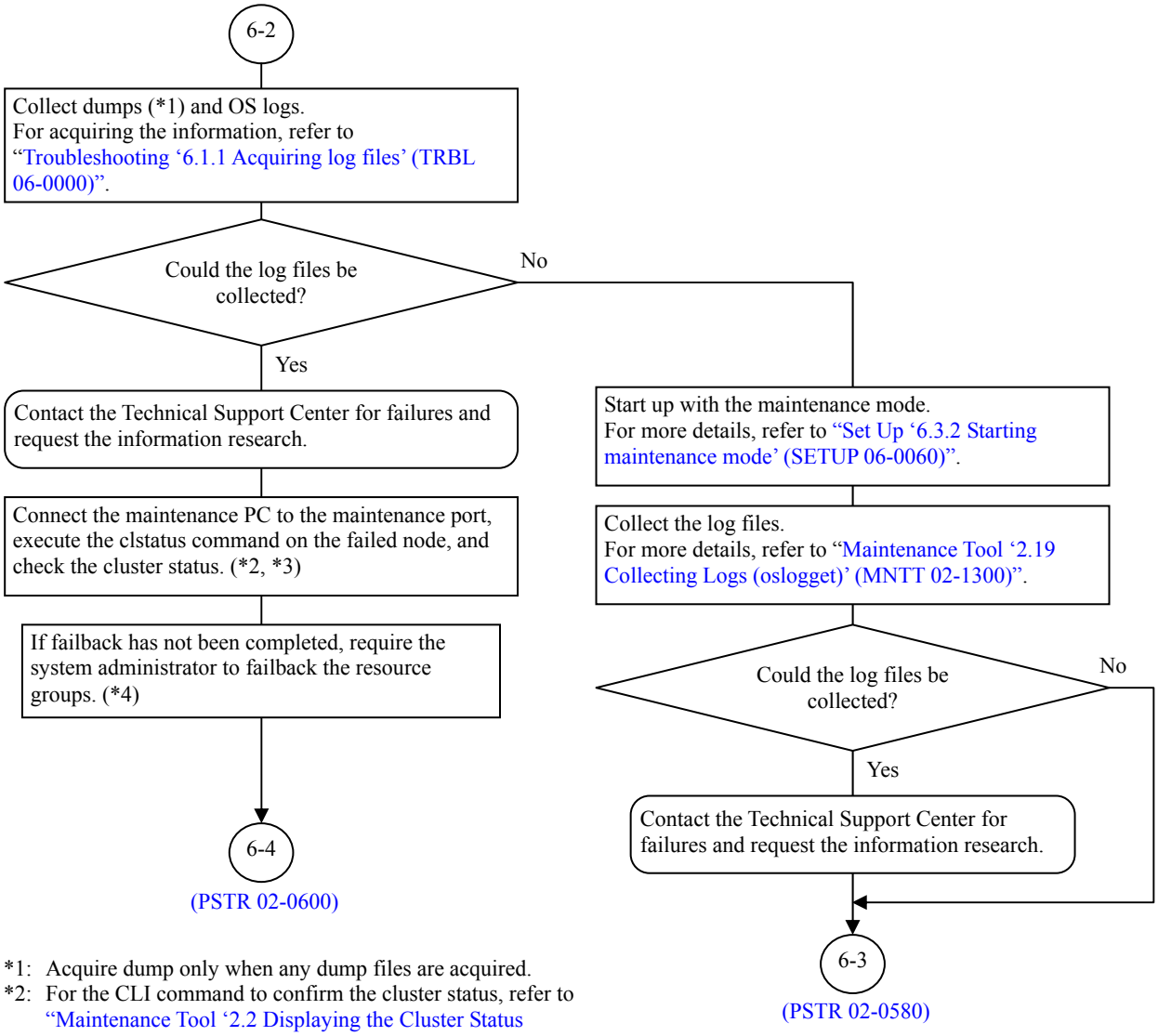

*1: Acquire dump only when any dump files are acquired.
*2: For the CLI command to confirm the cluster status, refer to "Maintenance Tool '2.2 Displaying the Cluster Status (clstatus)' (MNTT 02-0040)".
*3: In this case, we cannot identify the reason of OS outage, but we continue to identify the other failure.
*4: If the system administrator cannot execute the operation, maintenance personnel execute it under the system administrator's permission. For details of failover of a node, refer to "Maintenance Tool '2.54 Changing Resource Group Execution Node (rgmove)' (MNTT 02-3020)".

Figure C.2.3.2.2-6 Flow of Management Network Failure Determination (3/6)

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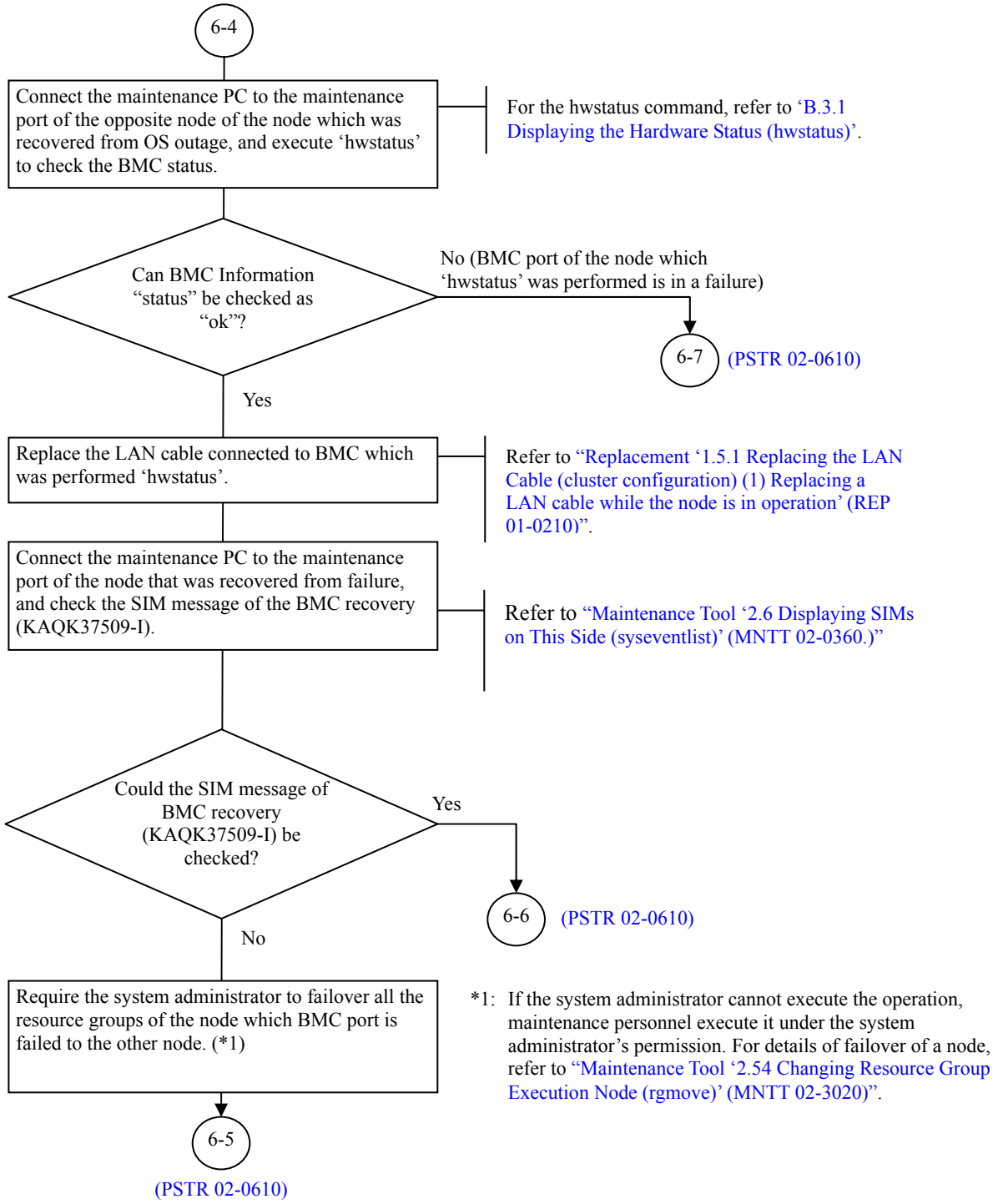

Figure C.2.3.2.2-6 Flow of Management Network Failure Determination (4/6)

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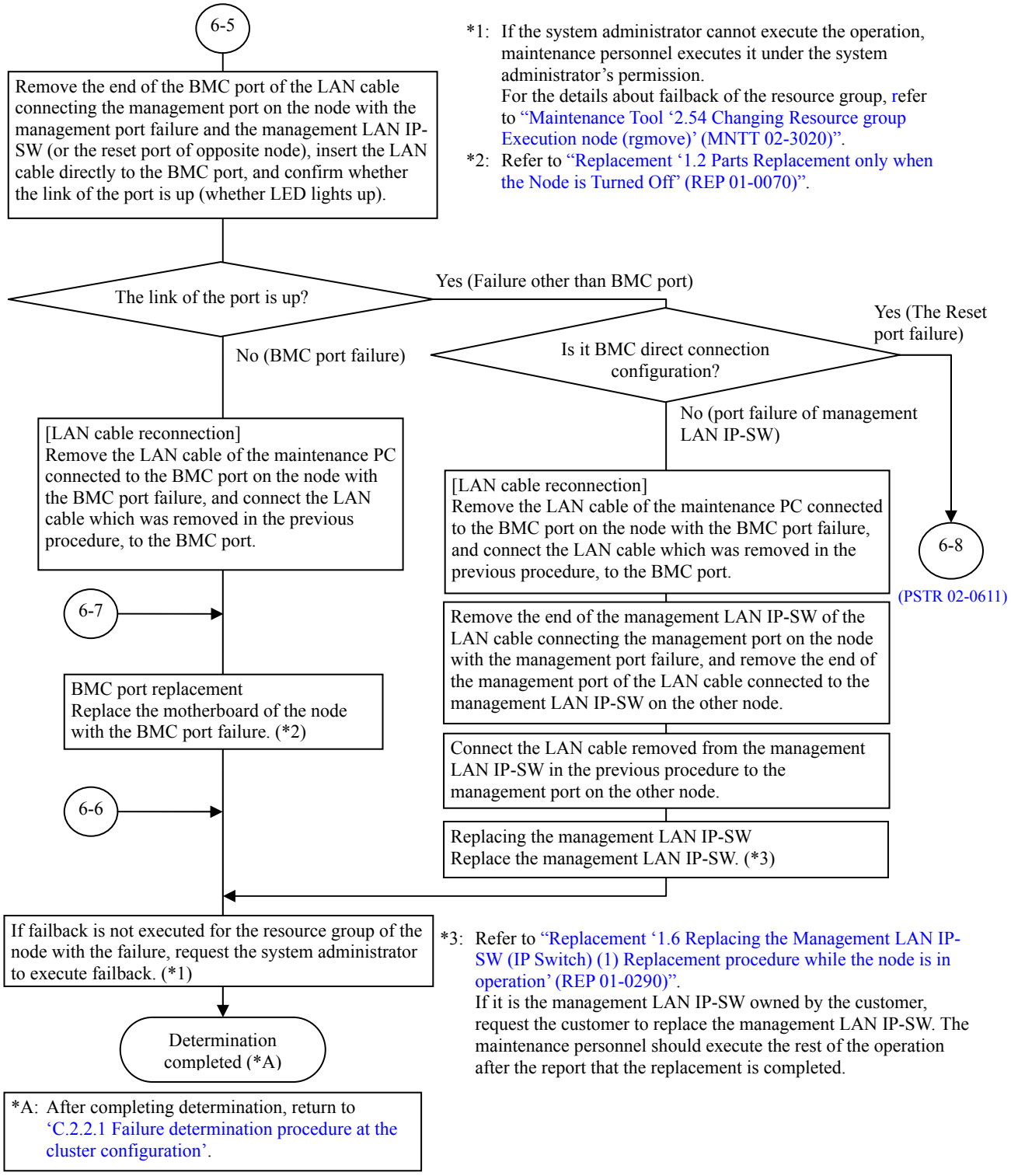

Figure C.2.3.2.2-6 Flow of Management Network Failure Determination (5/6)

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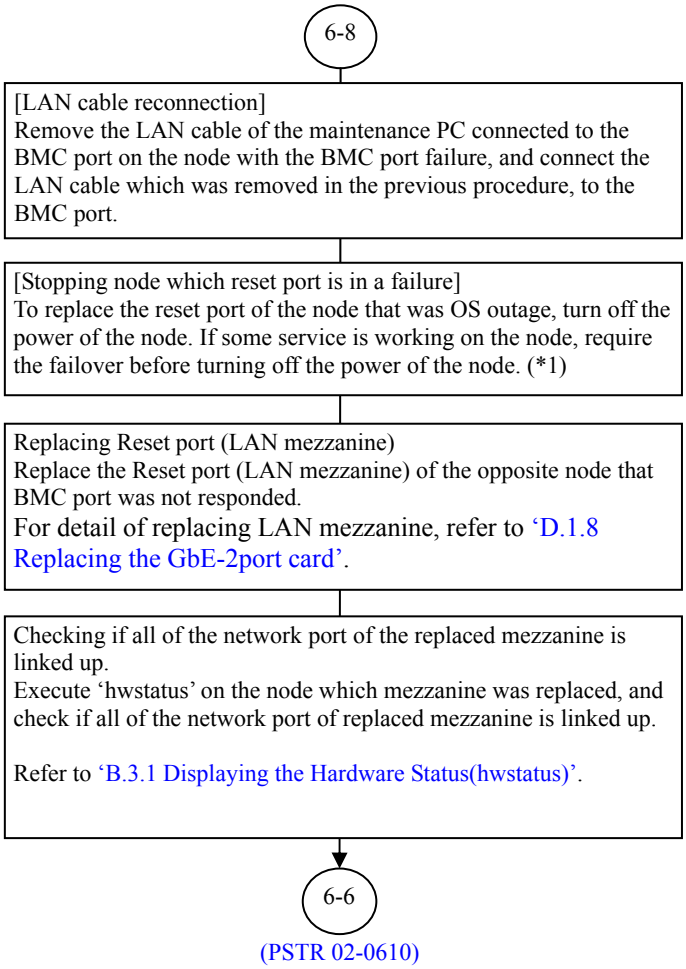

*1: Perform "nasshutdown - -force". For more detail, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

Figure C.2.3.2.2-6 Flow of Management Network Failure Determination (6/6)

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(7) Failure in the management ports of the both nodes

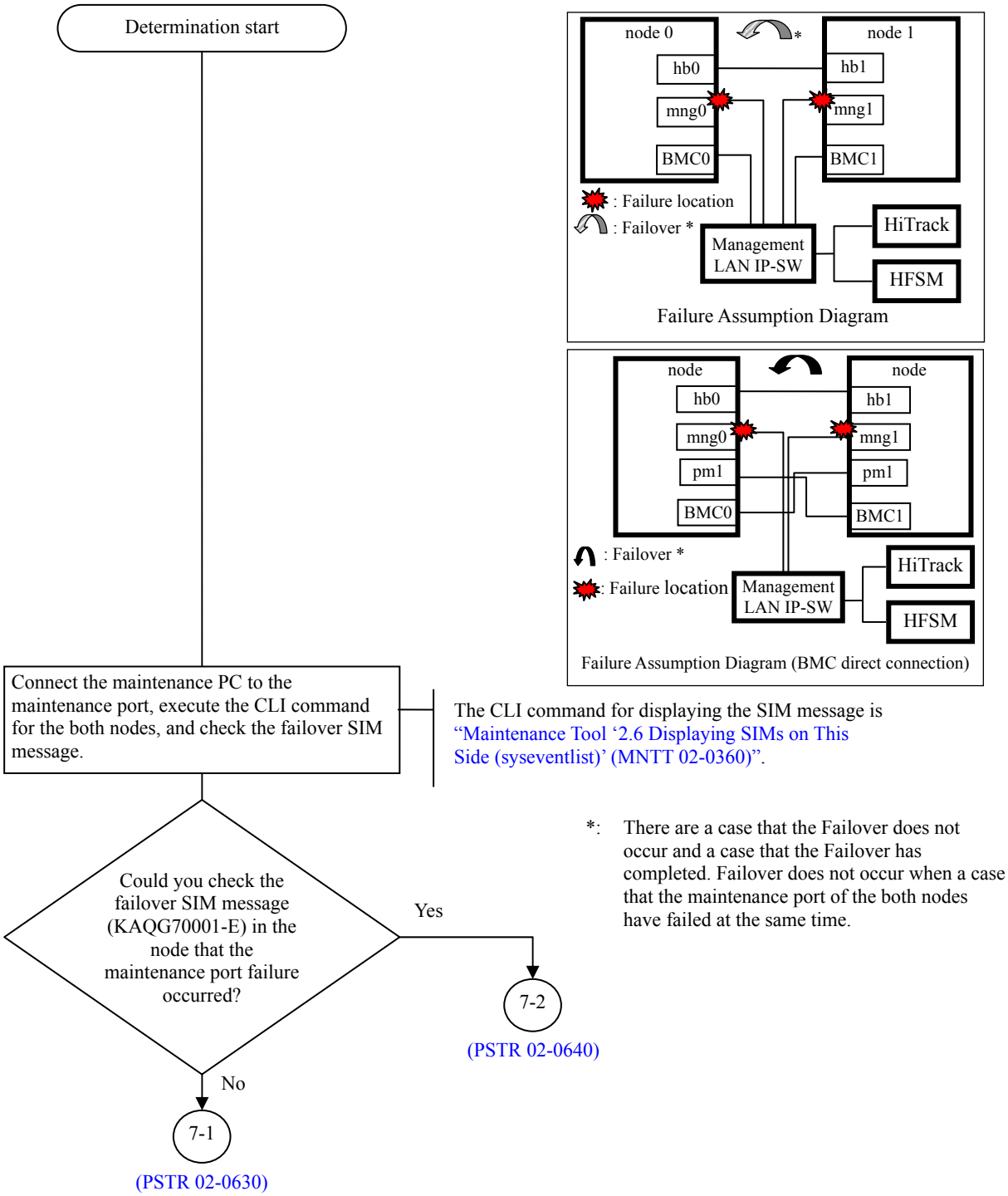

Figure C.2.3.2.2-7 Flow of Management Network Failure Determination (1/11)

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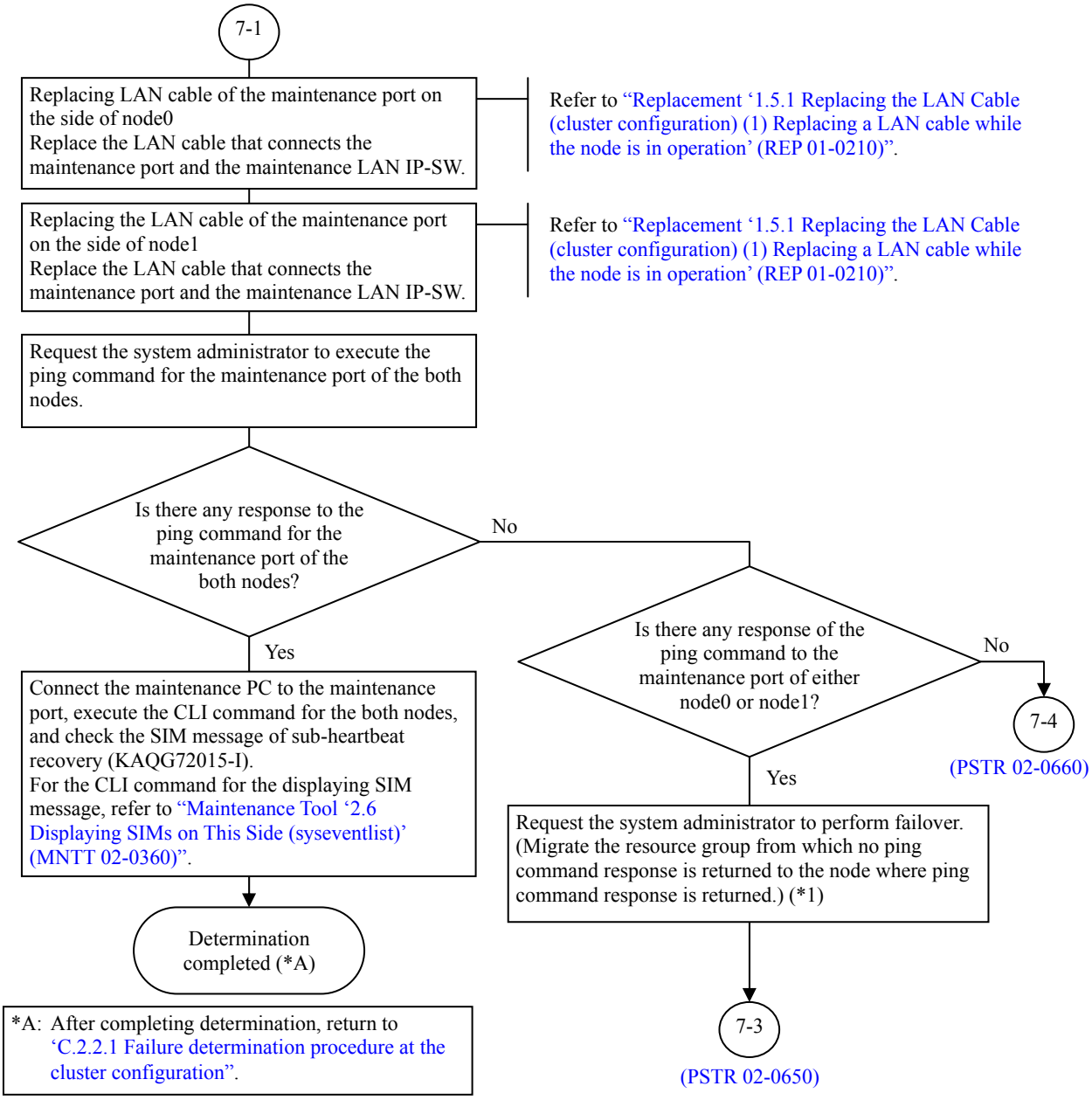

*1: If the system administrator cannot execute the operation, maintenance personnel execute it under the system administrator's permission. For the execution of failover when the resource group is in operation, refer to "Maintenance Tool '2.54 Changing Resource group Execution node (rgmove)' (MNTT 02-3020)".

Figure C.2.3.2.2-7 Flow of Management Network Failure Determination (2/11)

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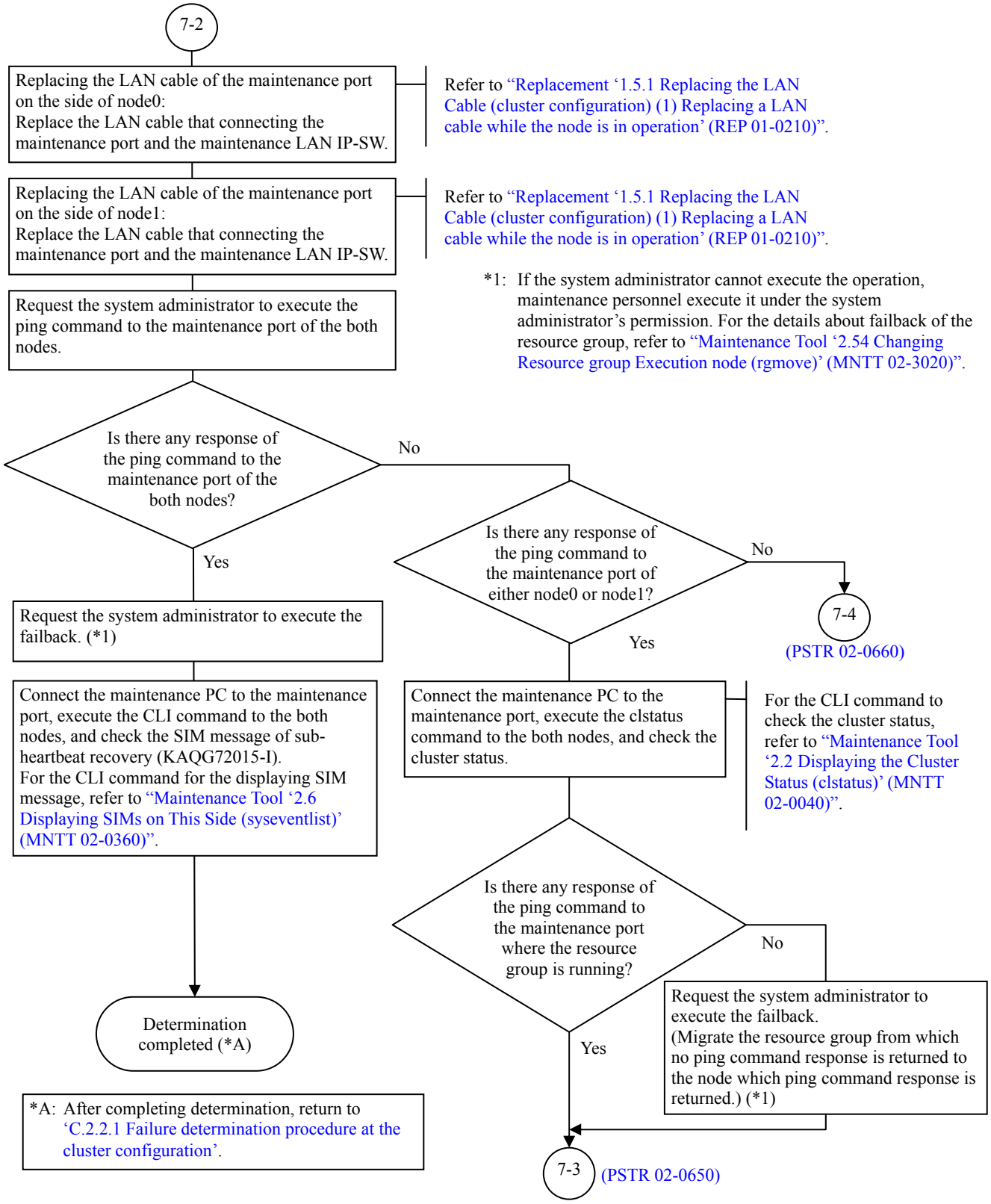

Figure C.2.3.2.2-7 Flow of Management Network Failure Determination (3/11)

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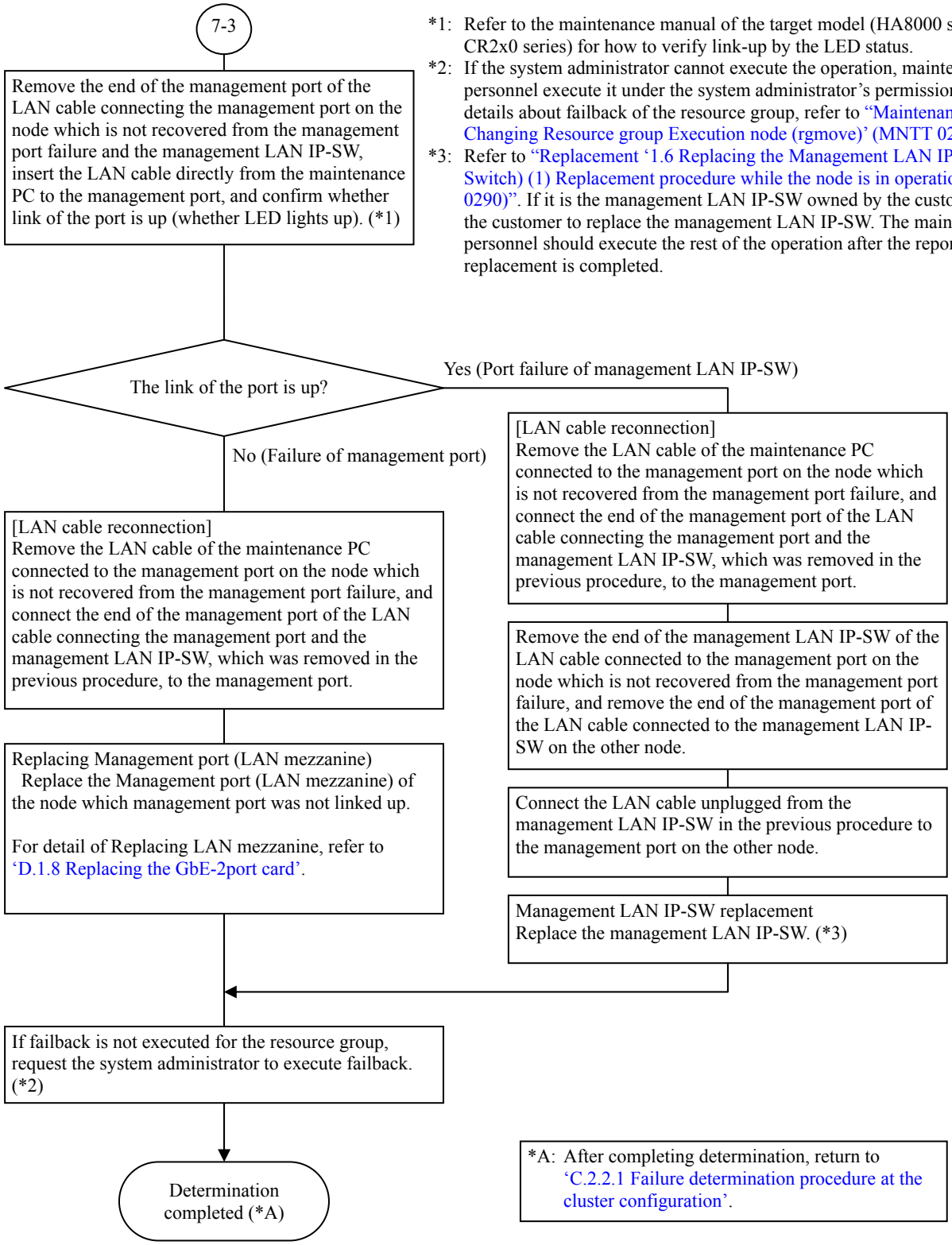

*1: Refer to the maintenance manual of the target model (HA8000 series / CR2x0 series) for how to verify link-up by the LED status.

*2: If the system administrator cannot execute the operation, maintenance personnel execute it under the system administrator's permission. For the details about failback of the resource group, refer to "Maintenance Tool '2.54 Changing Resource group Execution node (rgmove)' (MNTT 02-3020)".

*3: Refer to "Replacement '1.6 Replacing the Management LAN IP-SW (IP Switch) (1) Replacement procedure while the node is in operation' (REP 01-0290)". If it is the management LAN IP-SW owned by the customer, request the customer to replace the management LAN IP-SW. The maintenance personnel should execute the rest of the operation after the report that the replacement is completed.

Figure C.2.3.2.2-7 Flow of Management Network Failure Determination (4/11)

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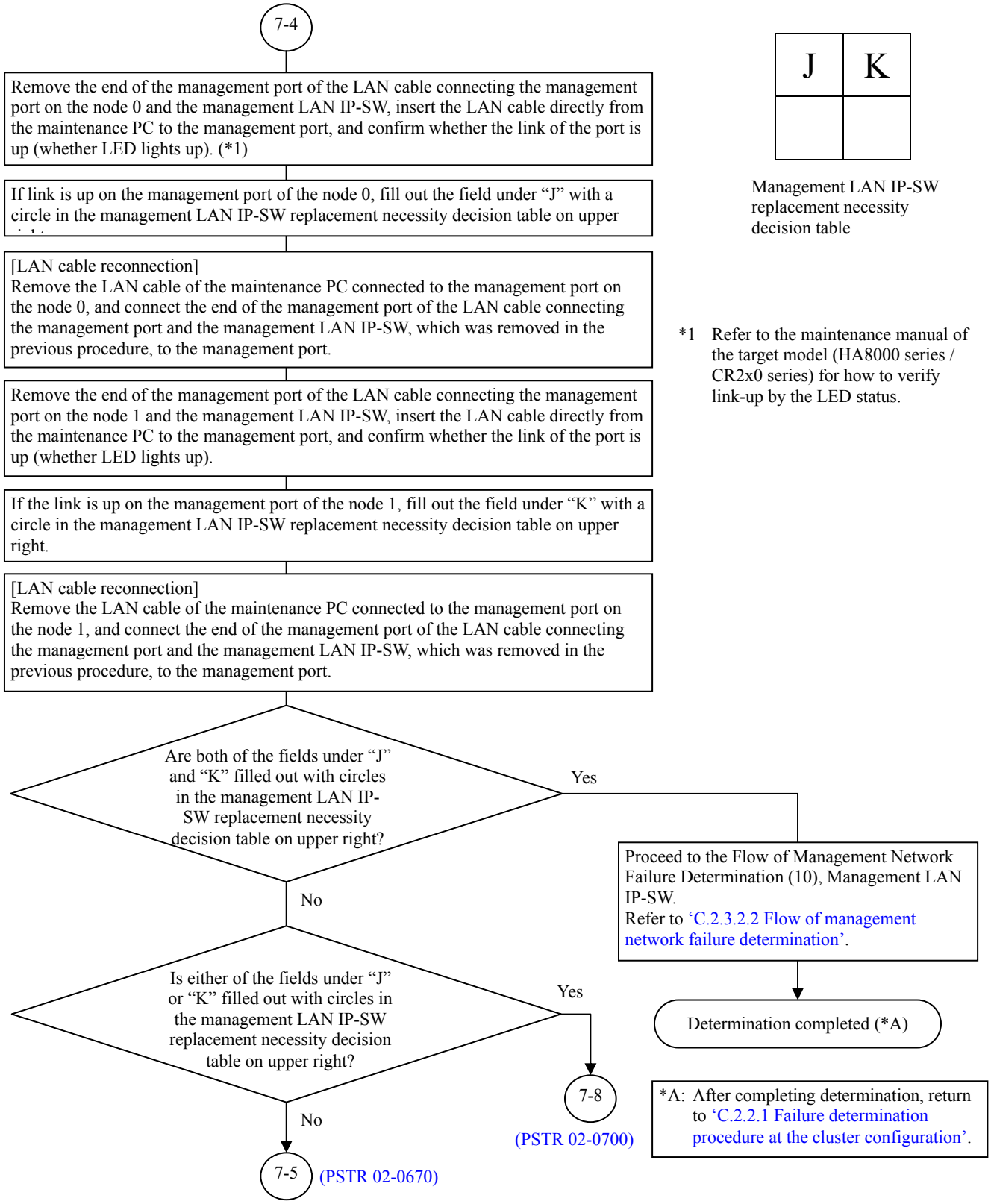

Figure C.2.3.2.2-7 Flow of Management Network Failure Determination (5/11)

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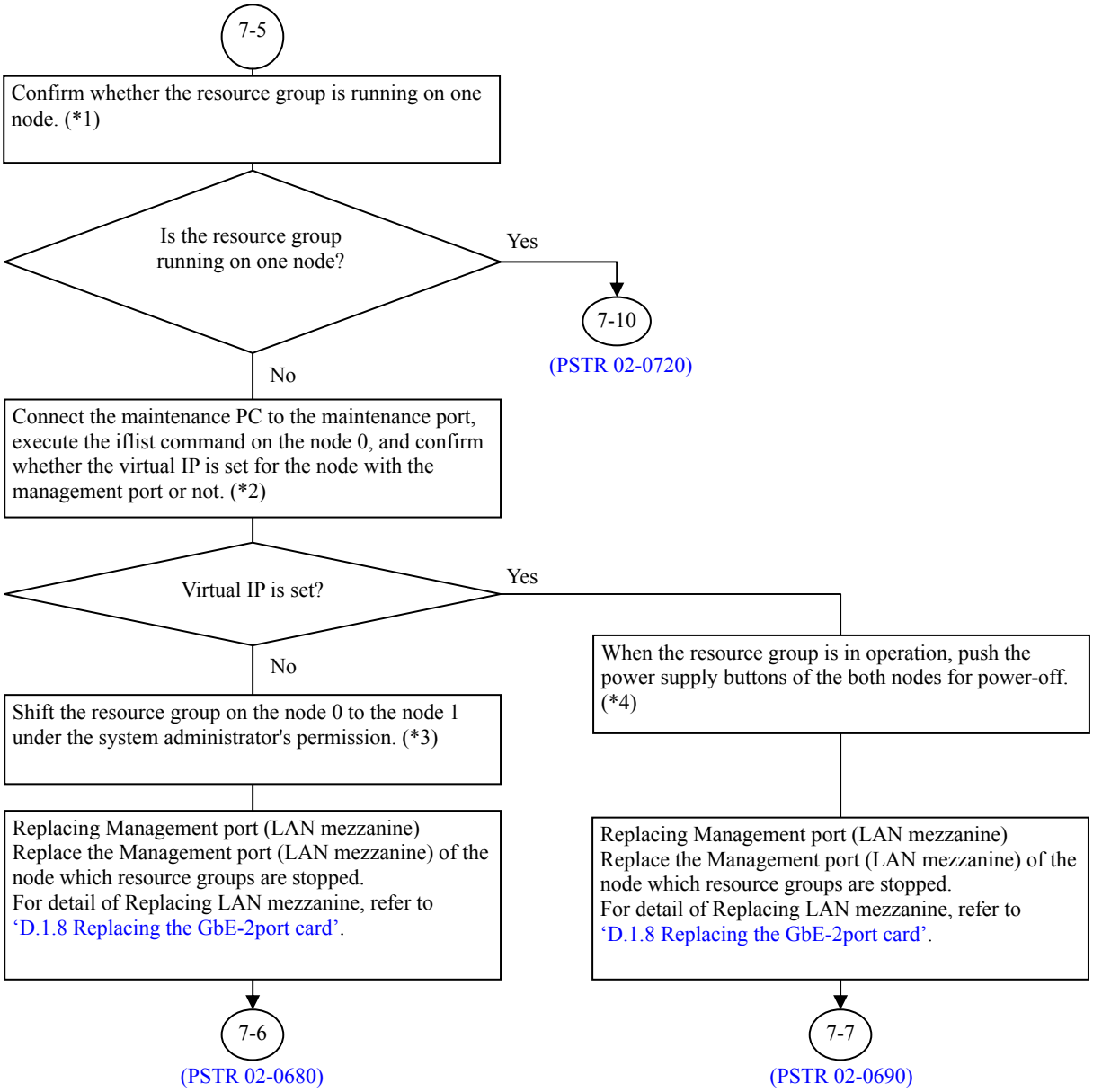

*1: For the confirmation of the resource group, refer to "Maintenance Tool '2.2 Displaying the Cluster Status (clstatus)' (MNTT 02-0040)".
*2: Refer to "Maintenance Tool '2.4 Displaying the Network Status (iflist)' (MNTT 02-0200)".
*3: Maintenance personnel should execute it under the system administrator's permission. For the details about failback of the resource group, refer to "Maintenance Tool '2.54 Changing Resource group Execution node (rgmove)' (MNTT 02-3020)".
*4: Refer to "Installation '2.1.2.2 Terminating the OS of the node by operating the power button' (INST 02-0080)".

Figure C.2.3.2.2-7 Flow of Management Network Failure Determination (6/11)

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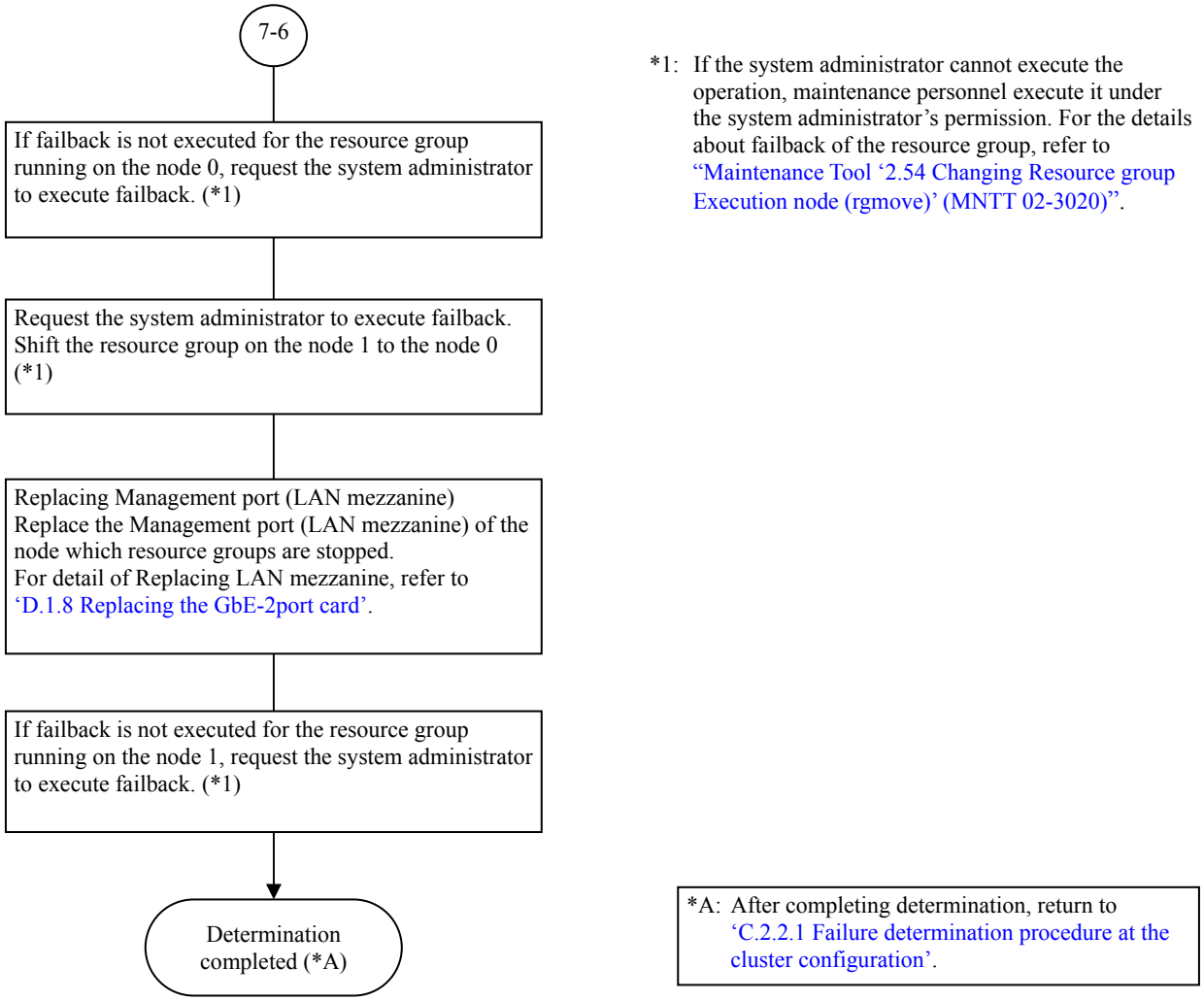

Figure C.2.3.2.2-7 Flow of Management Network Failure Determination (7/11)

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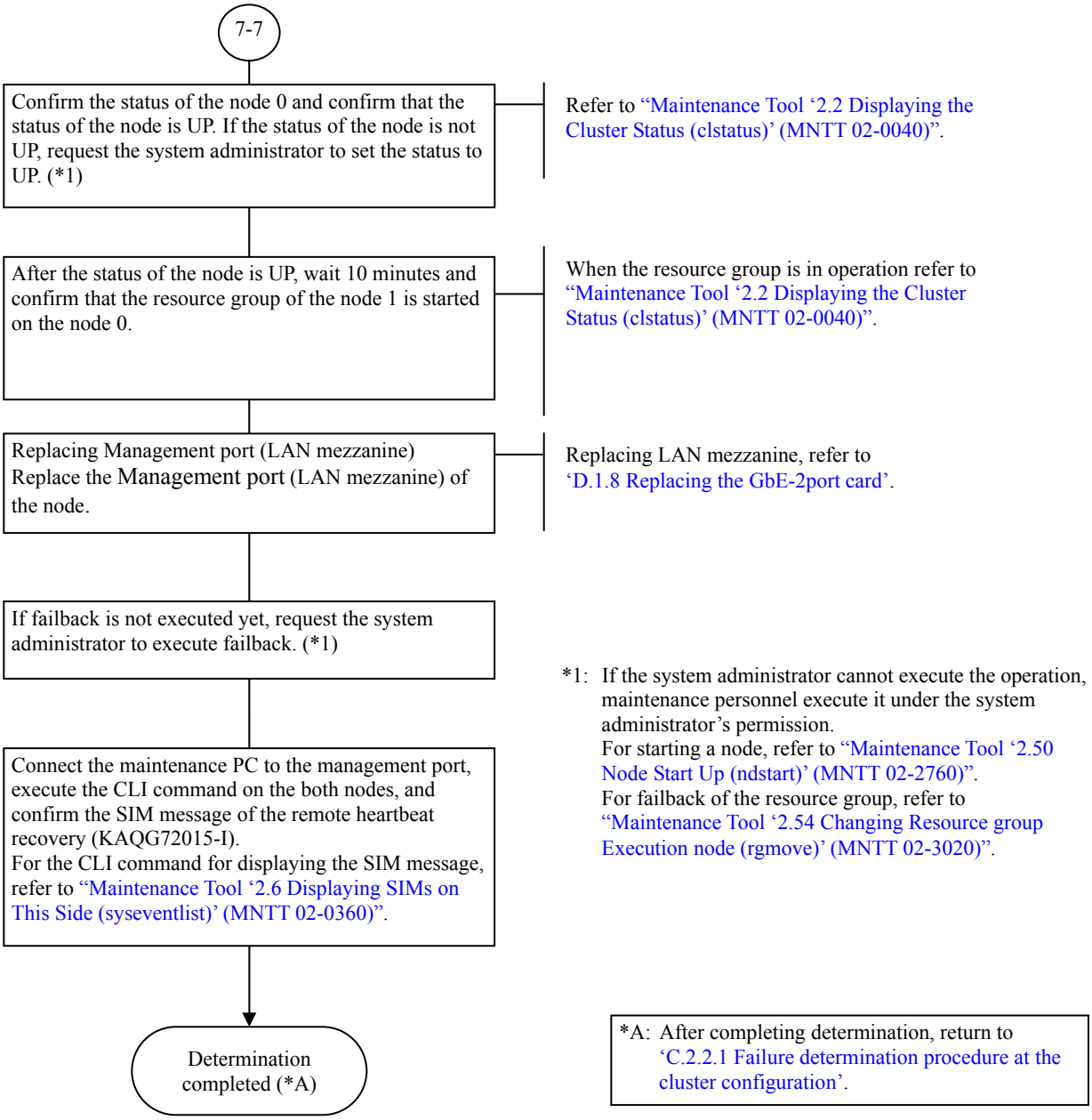

Figure C.2.3.2.2-7 Flow of Management Network Failure Determination (8/11)

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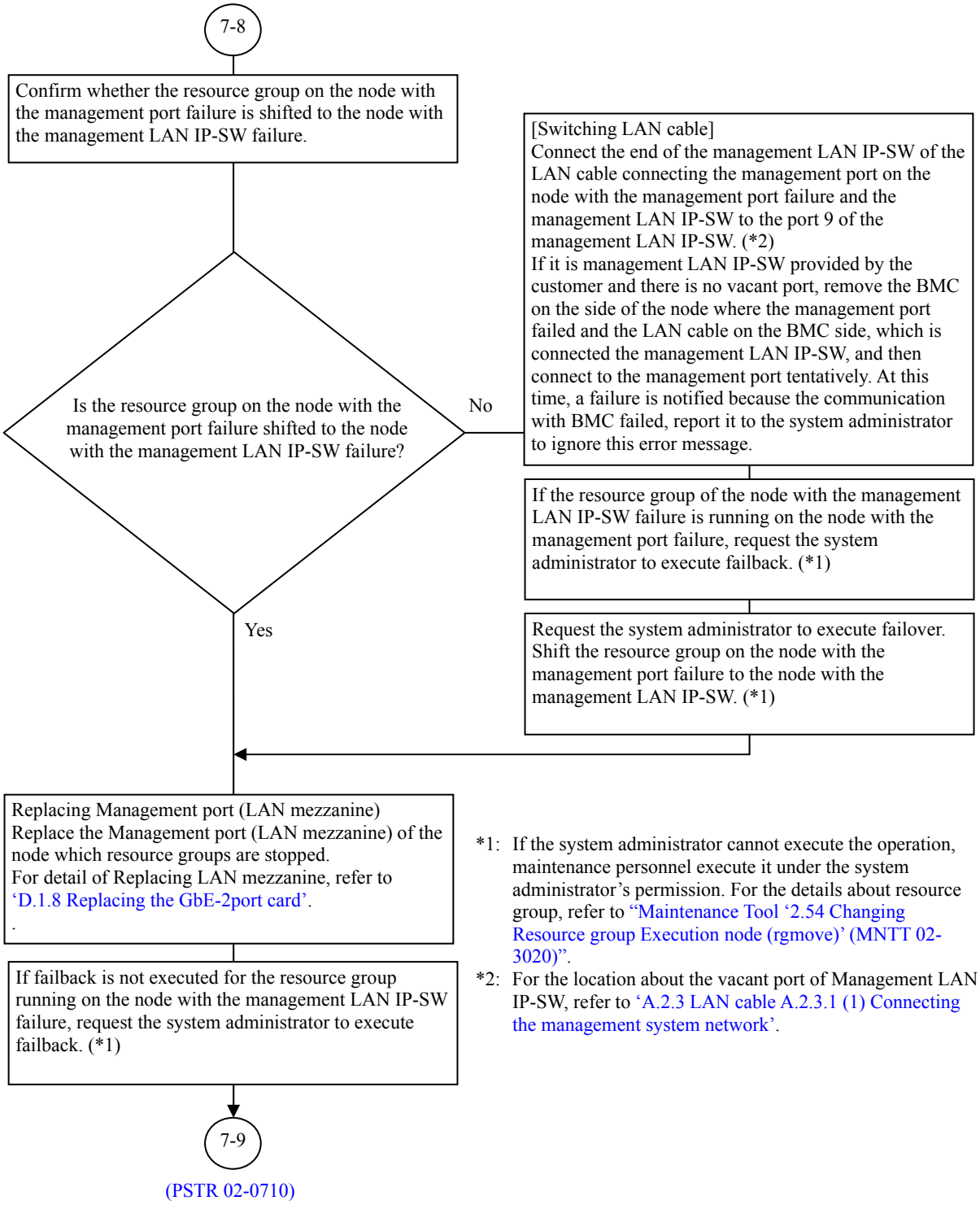

*1: If the system administrator cannot execute the operation, maintenance personnel execute it under the system administrator's permission. For the details about resource group, refer to "Maintenance Tool '2.54 Changing Resource group Execution node (rgmove)' (MNTT 02-3020)".

*2: For the location about the vacant port of Management LAN IP-SW, refer to 'A.2.3 LAN cable A.2.3.1 (1) Connecting the management system network'.

Figure C.2.3.2.2-7 Flow of Management Network Failure Determination (9/11)

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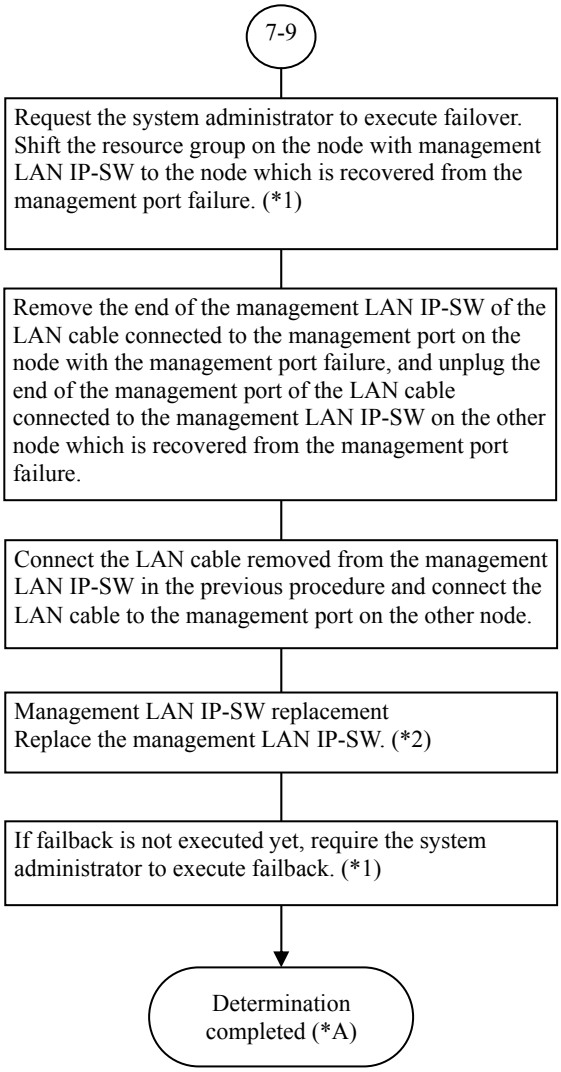

*1: If the system administrator cannot execute the operation, maintenance personnel execute it under the system administrator's permission. For the details about resource group, refer to "Maintenance Tool '2.54 Changing Resource group Execution node (rgmove)' (MNTT 02-3020)".

*2: For the location of a free port in the management LAN IP-SW, refer to "Replacement '1.6 Replacing the Management LAN IP-SW (IP Switch) (1) Replacement procedure while the node is in operation' (REP 01-0290)". If it is the management LAN IP-SW owned by the customer, request the customer to replace the management LAN IP-SW. request the replacement. The maintenance personnel should execute the rest of the operation after the report that the replacement is completed.

*A: After completing determination, return to 'C.2.2.1 Failure determination procedure at the cluster configuration'.

Figure C.2.3.2.2-7 Flow of Management Network Failure Determination (10/11)

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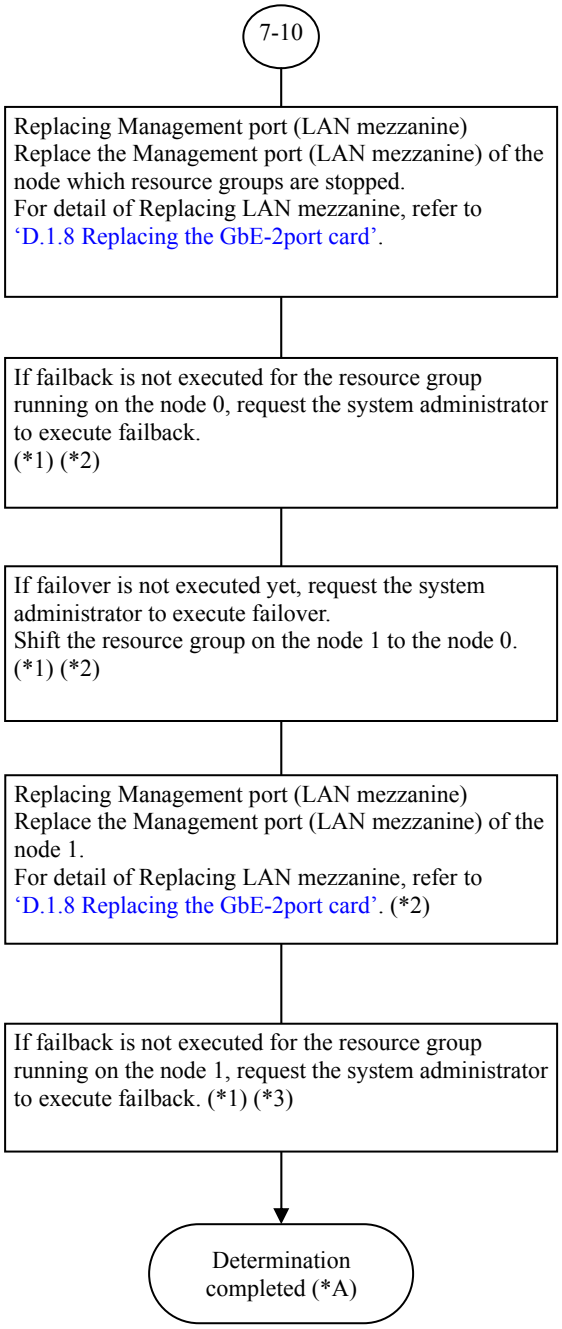

*1: If the system administrator cannot execute the operation, maintenance personnel execute it under the system administrator's permission. For the details about resource group, refer to "Maintenance Tool '2.54 Changing Resource group Execution node (rgmove)' (MNTT 02-3020)".

*2: If the management port on the node 1 is already replaced, read the node 1 as the node 0, and the node 0 as the node 1.

*3: If the management port on the node 0 is replaced in the previous procedure, read the node 1 as the node 0.

*A: After completing determination, return to 'C.2.2.1 Failure determination procedure at the cluster configuration'.

Figure C.2.3.2.2-7 Flow of Management Network Failure Determination (11/11)

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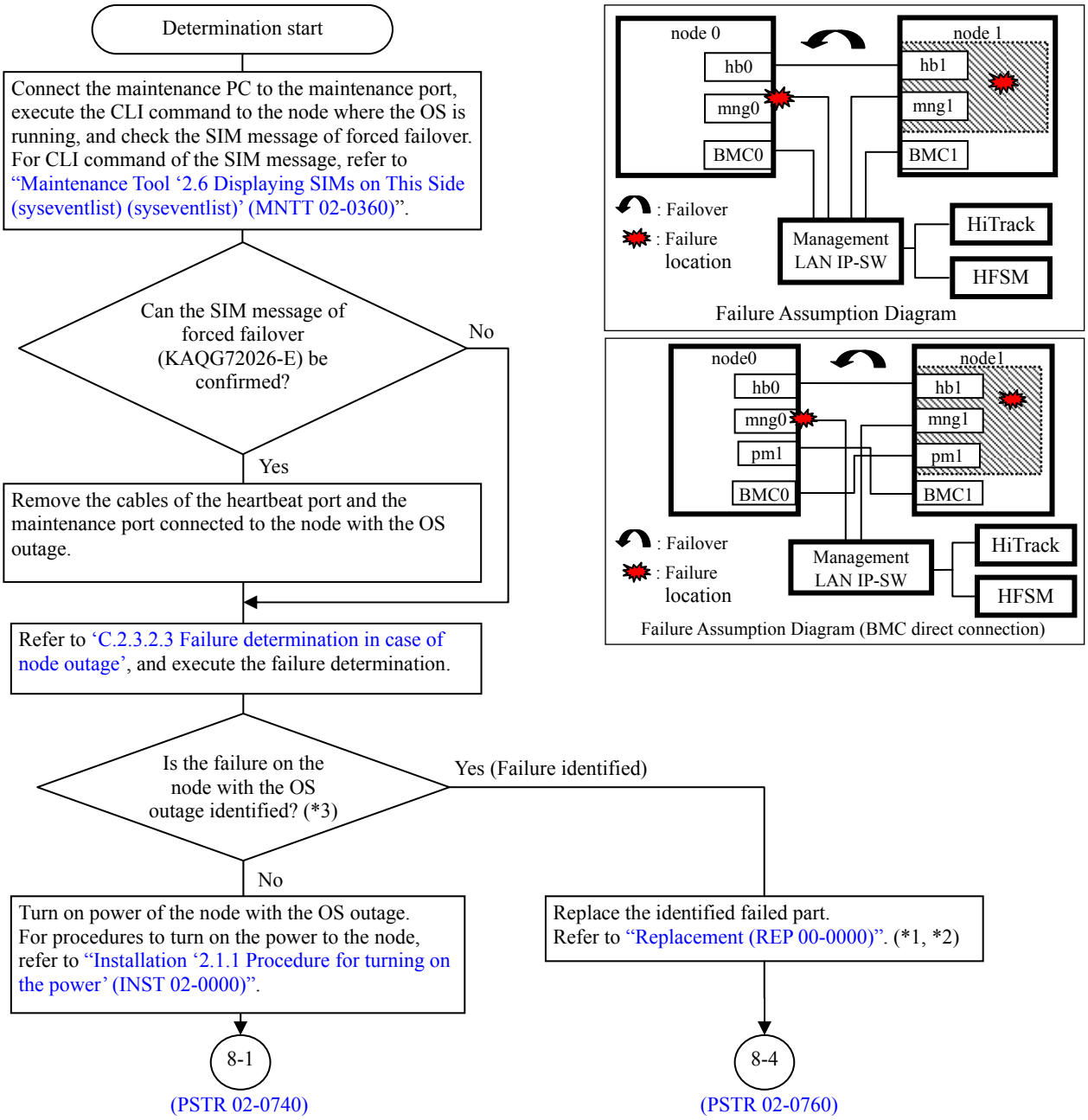
(8) Failure in the management port of the other node after the OS down and the failover completion



*1: Replace the parts and confirm after the replacement with the heartbeat cable and the management port cable removed. Do not request the system administrator to execute failback.
*2: Make sure to collect Simple log by using HATP before the parts replacement.
*3: When you find the RC(Reference Code) from the HATP result or when you find the parts to be replaced from the MAINTENANCE LED, failure on the node with the OS outage is identified.
In the case HATP finished with no error, the failure has not yet identified.
In the case MAINTENANCE LED is lit "01" but both of internal HDDs are alive, the failure has not yet been identified.
In these 2 cases, some hardware within a chassis might be in failure (e.g. RAID controller).

Figure C.2.3.2.2-8 Flow of Management Network Failure Determination (1/7)

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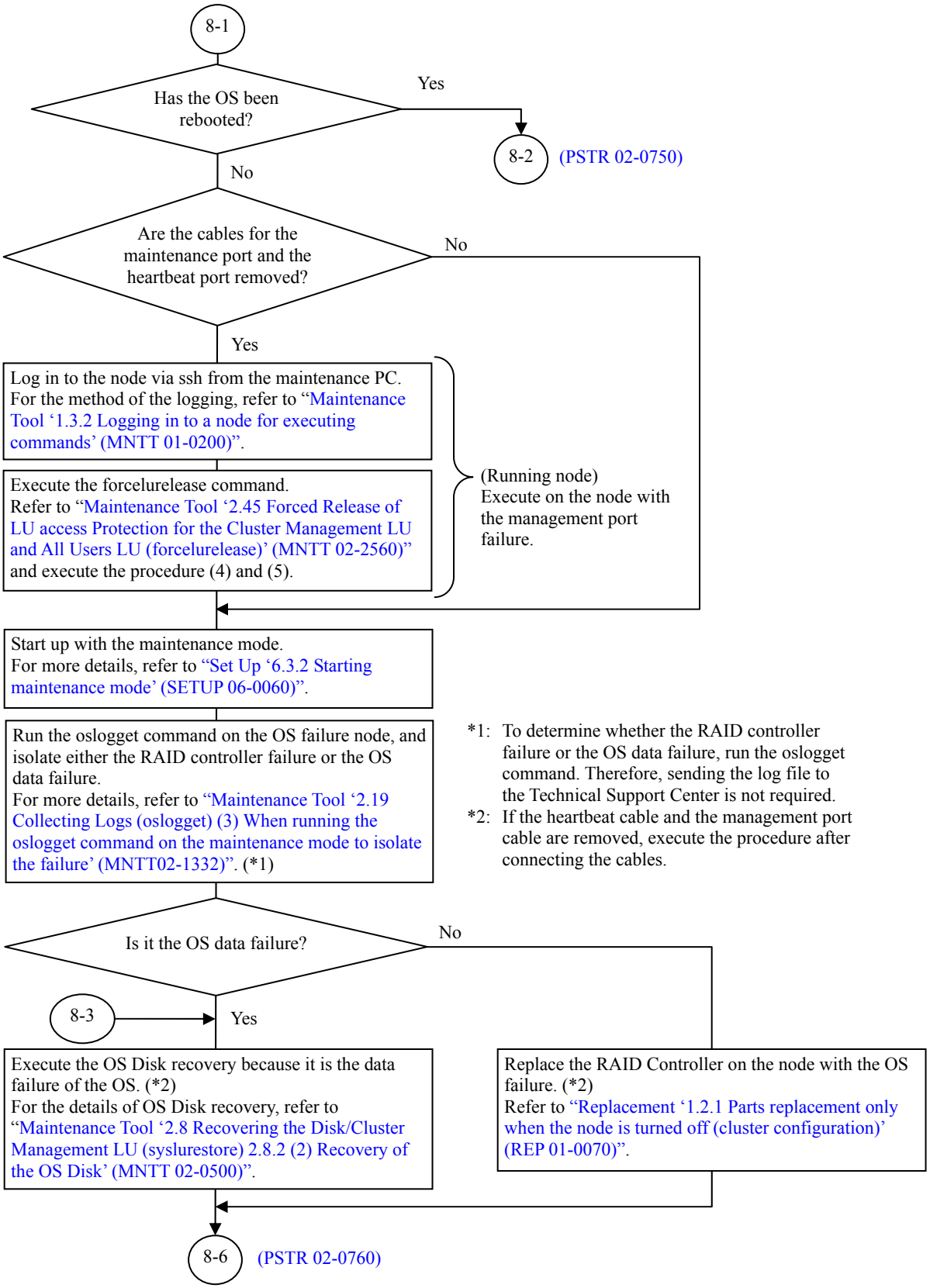

Figure C.2.3.2.2-8 Flow of Management Network Failure Determination (2/7)

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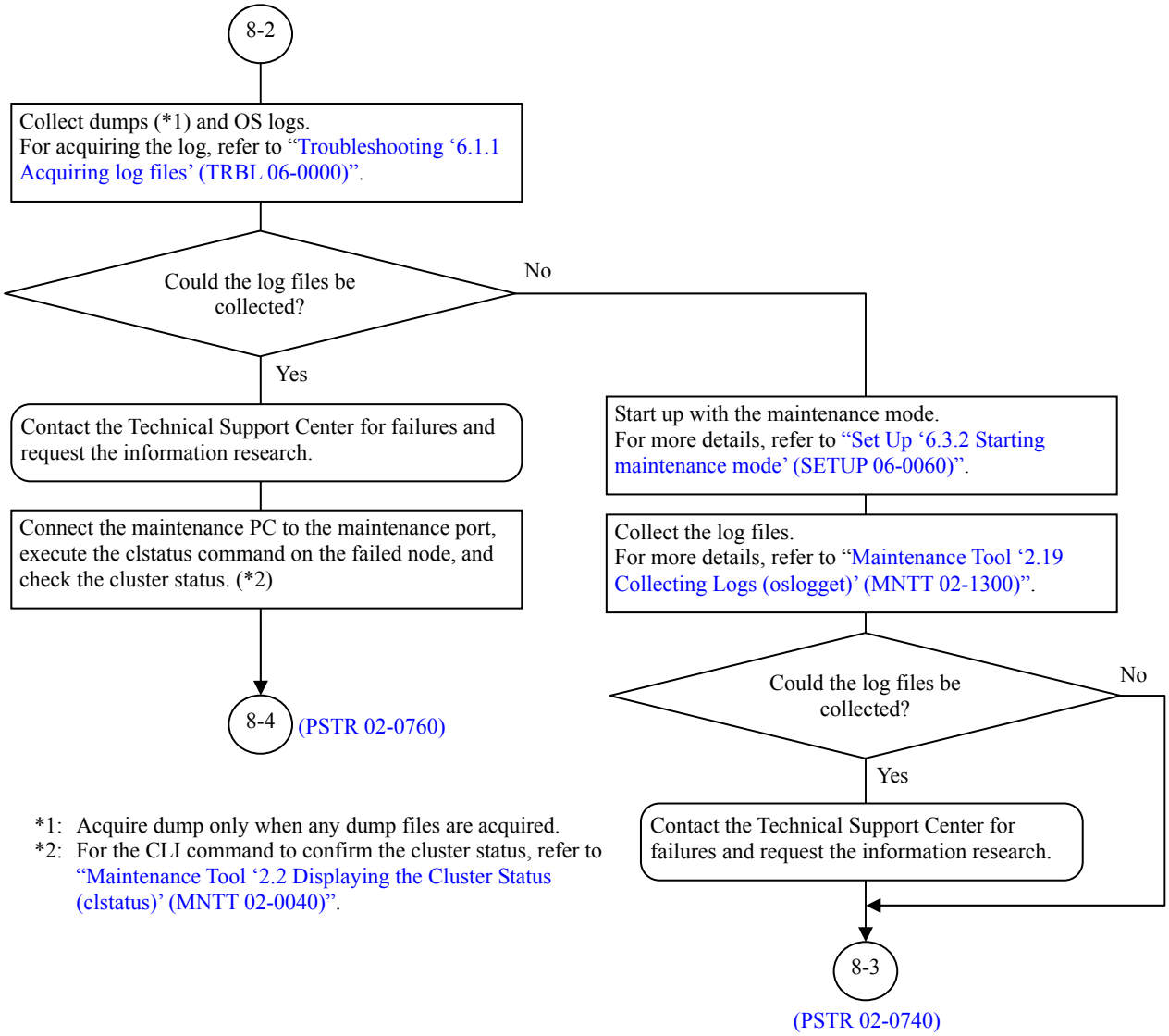

*1: Acquire dump only when any dump files are acquired.
*2: For the CLI command to confirm the cluster status, refer to "Maintenance Tool '2.2 Displaying the Cluster Status (clstatus)' (MNTT 02-0040)".

Figure C.2.3.2.2-8 Flow of Management Network Failure Determination (3/7)

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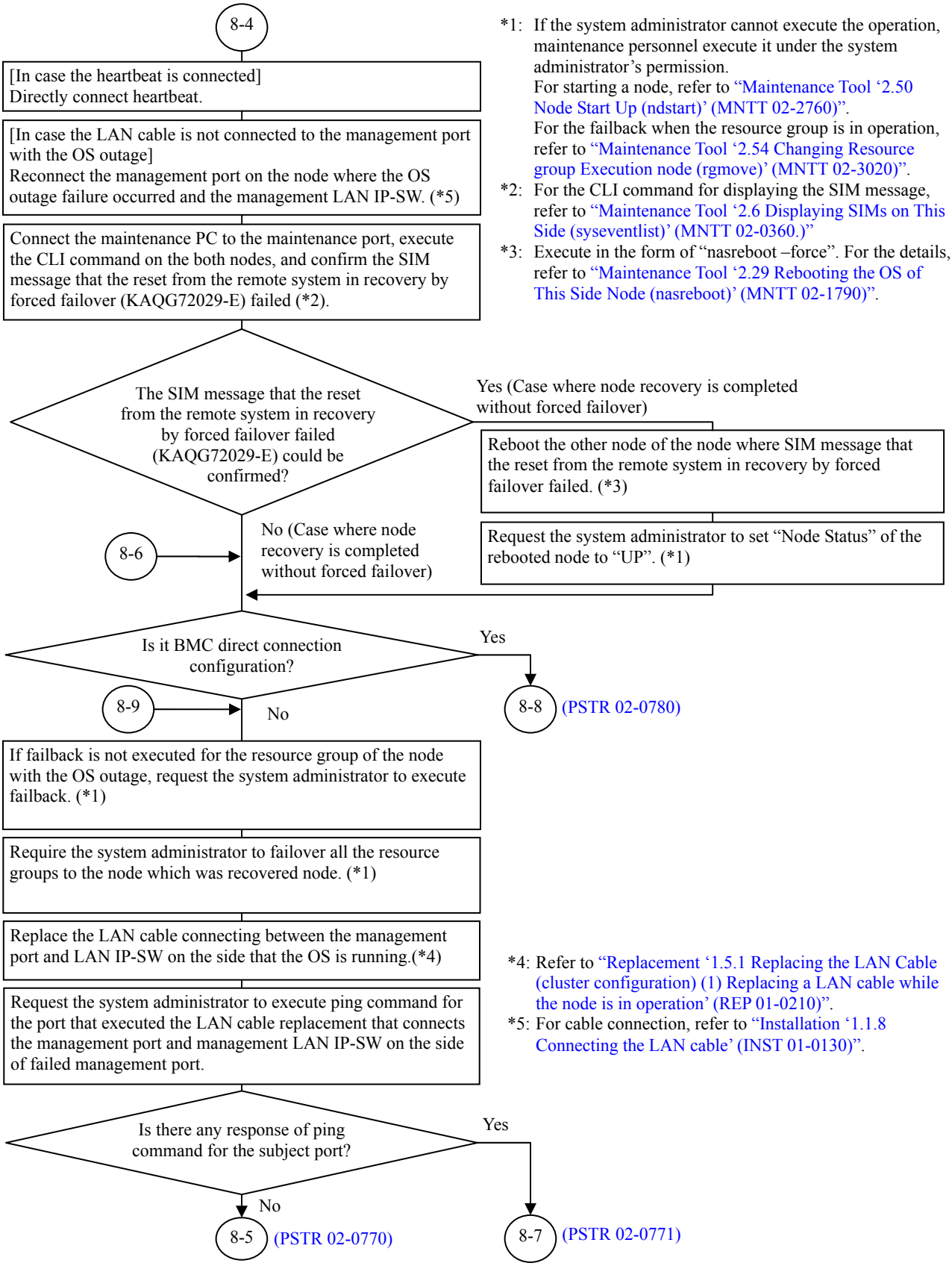

*1: If the system administrator cannot execute the operation, maintenance personnel execute it under the system administrator's permission.
For starting a node, refer to "Maintenance Tool '2.50 Node Start Up (ndstart)' (MNTT 02-2760)".
For the failback when the resource group is in operation, refer to "Maintenance Tool '2.54 Changing Resource group Execution node (rgmove)' (MNTT 02-3020)".

*2: For the CLI command for displaying the SIM message, refer to "Maintenance Tool '2.6 Displaying SIMs on This Side (syseventlist)' (MNTT 02-0360.)"

*3: Execute in the form of "nasreboot –force". For the details, refer to "Maintenance Tool '2.29 Rebooting the OS of This Side Node (nasreboot)' (MNTT 02-1790)".

*4: Refer to "Replacement '1.5.1 Replacing the LAN Cable (cluster configuration) (1) Replacing a LAN cable while the node is in operation' (REP 01-0210)".

*5: For cable connection, refer to "Installation '1.1.8 Connecting the LAN cable' (INST 01-0130)".

Figure C.2.3.2.2-8 Flow of Management Network Failure Determination (4/7)

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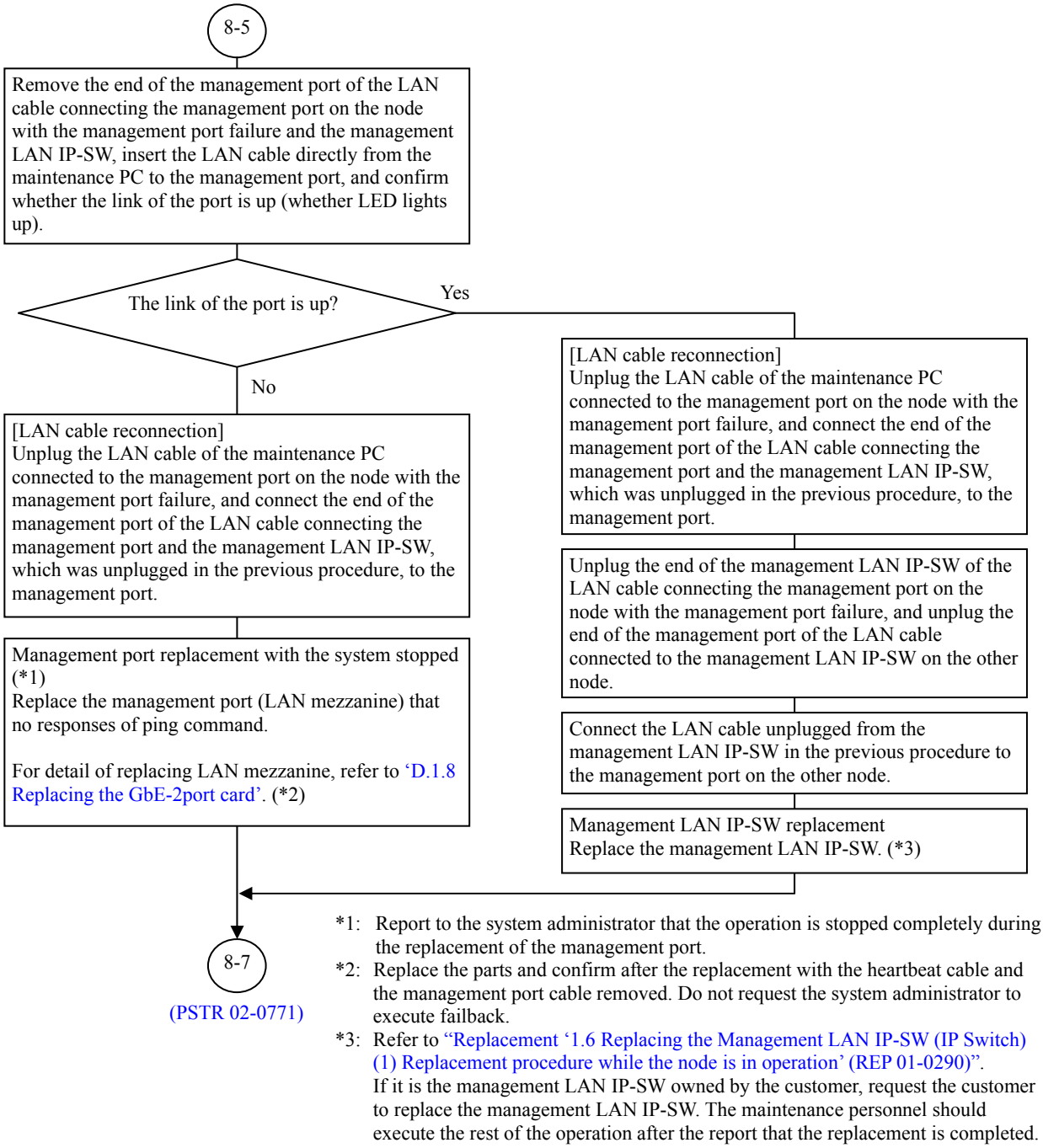

*1: Report to the system administrator that the operation is stopped completely during the replacement of the management port.

*2: Replace the parts and confirm after the replacement with the heartbeat cable and the management port cable removed. Do not request the system administrator to execute failback.

*3: Refer to "Replacement '1.6 Replacing the Management LAN IP-SW (IP Switch) (1) Replacement procedure while the node is in operation' (REP 01-0290)". If it is the management LAN IP-SW owned by the customer, request the customer to replace the management LAN IP-SW. The maintenance personnel should execute the rest of the operation after the report that the replacement is completed.

Figure C.2.3.2.2-8 Flow of Management Network Failure Determination (5/7)

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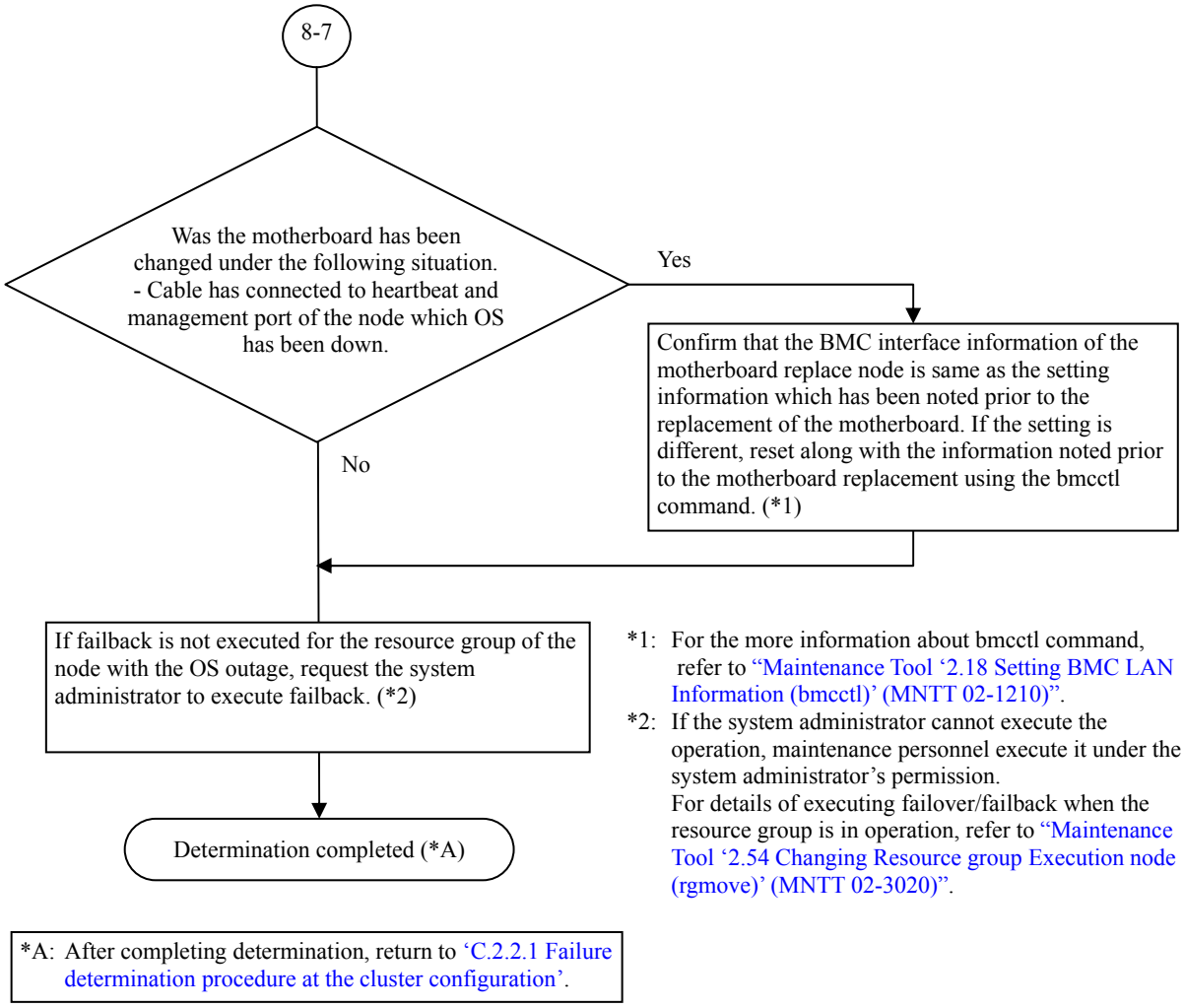

*1: For the more information about bmcctl command, refer to "Maintenance Tool '2.18 Setting BMC LAN Information (bmcctl)' (MNTT 02-1210)".

*2: If the system administrator cannot execute the operation, maintenance personnel execute it under the system administrator's permission.
For details of executing failover/failback when the resource group is in operation, refer to "Maintenance Tool '2.54 Changing Resource group Execution node (rgmove)' (MNTT 02-3020)".

*A: After completing determination, return to 'C.2.2.1 Failure determination procedure at the cluster configuration'.

Figure C.2.3.2.2-8 Flow of Management Network Failure Determination (6/7)

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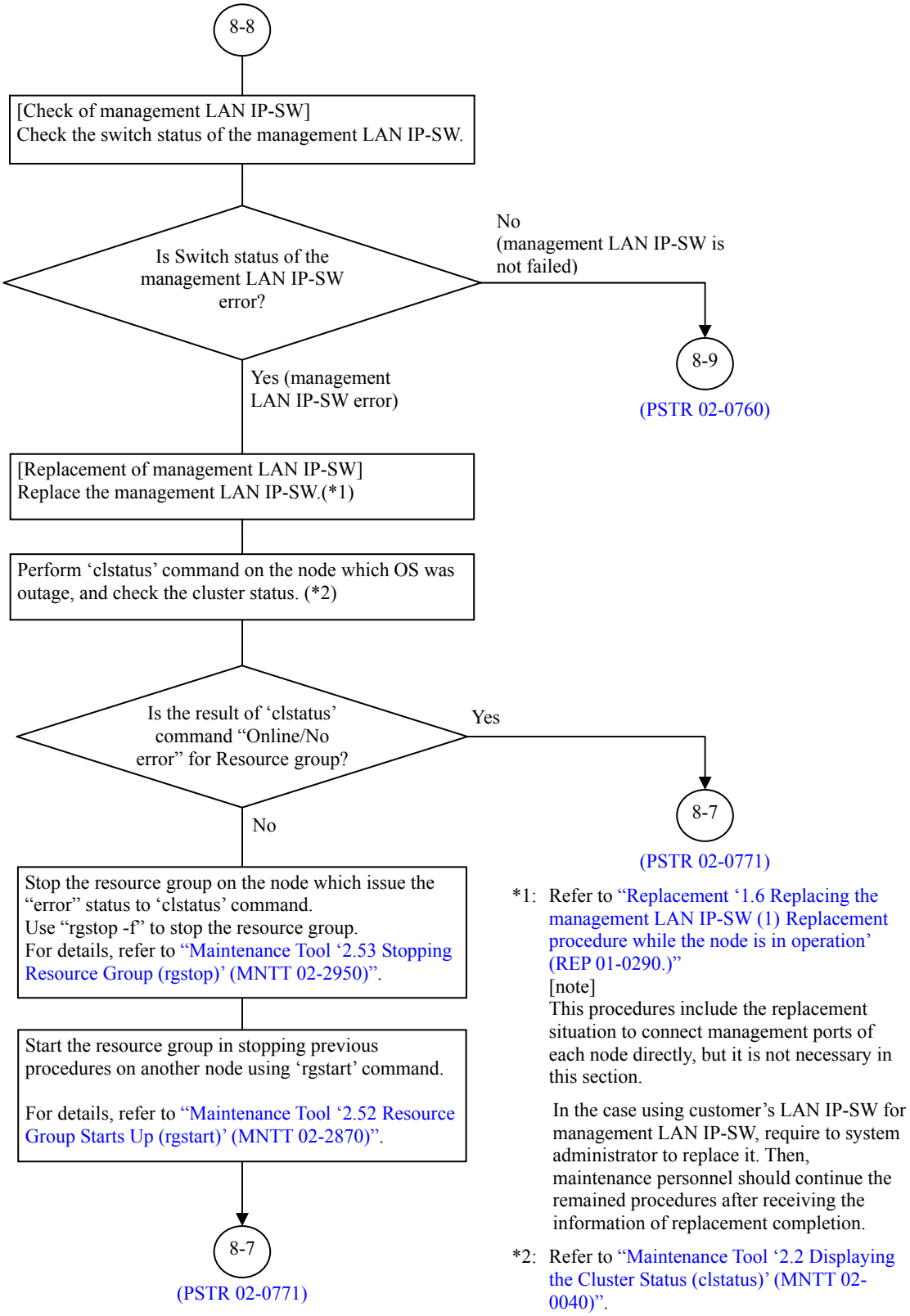

Figure C.2.3.2.2-8 Flow of Management Network Failure Determination (7/7)

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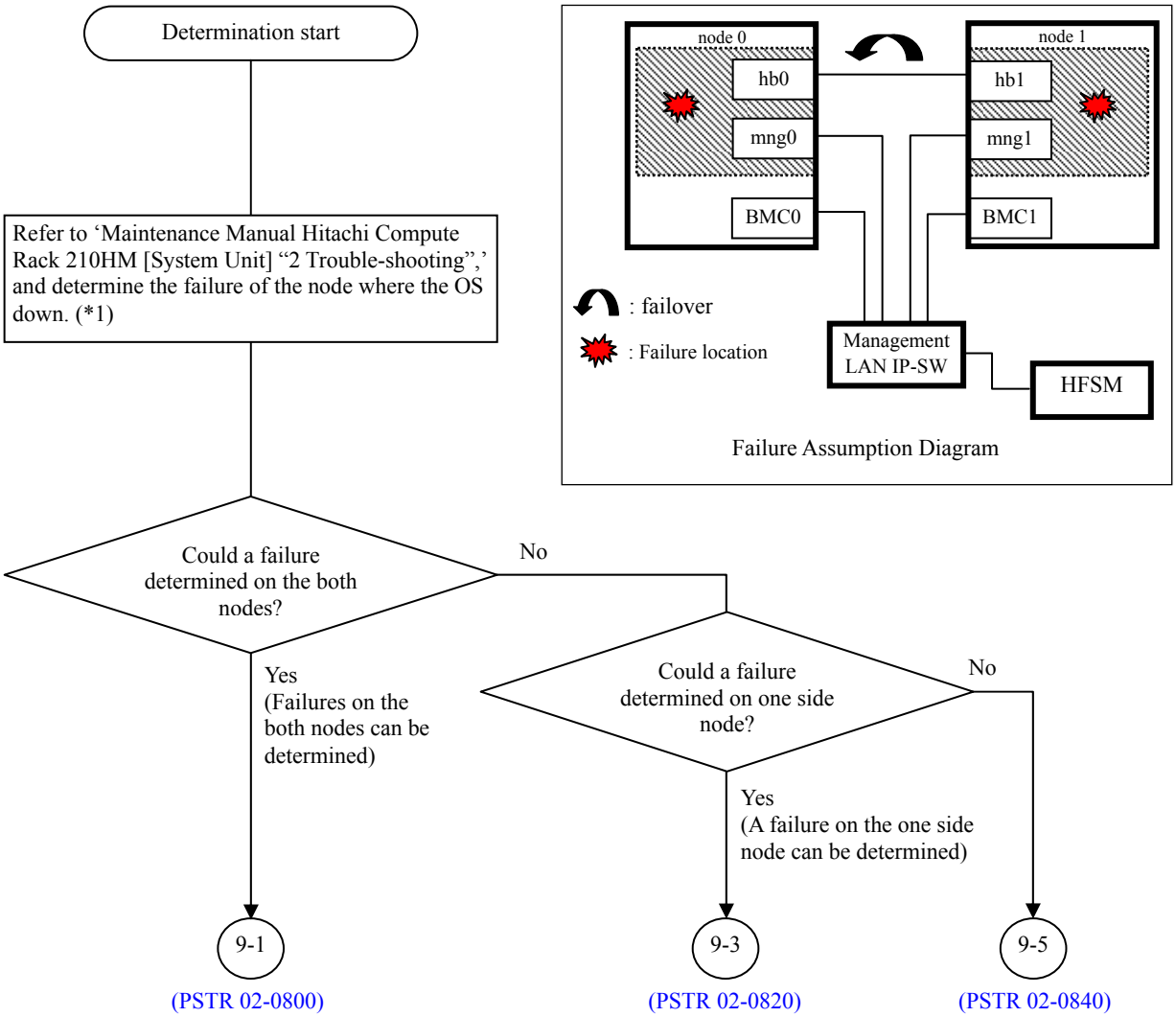
(9) Dual failure of OS



*1: Determining a candidate failure part means that the RC can be determined from the result of HATP, or a failure candidate can be determined from the MAINTENANCE lamp display.
However, when the MAINTENANCE lamp lights up as "01" and it is not dual failure of the embedded HDD, or when there is no problem on the result of the HATP, a failure in the hardware such as on RAID controller might not be detected. In this case, assume that the hardware failure cannot be determined.

Figure C.2.3.2.2-9 Flow of Management Network Failure Determination (1/6)

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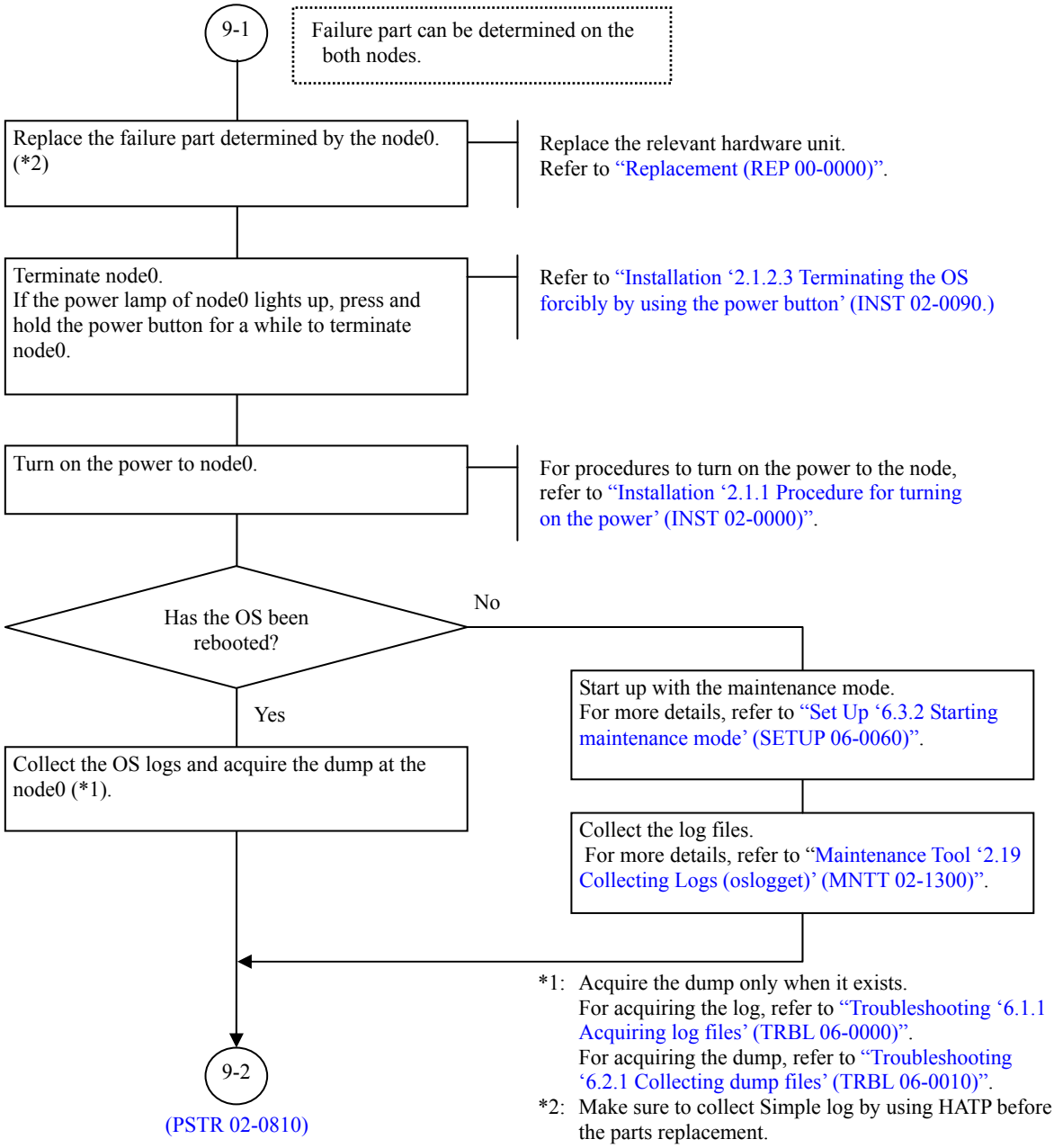

Figure C.2.3.2.2-9 Flow of Management Network Failure Determination (2/6)

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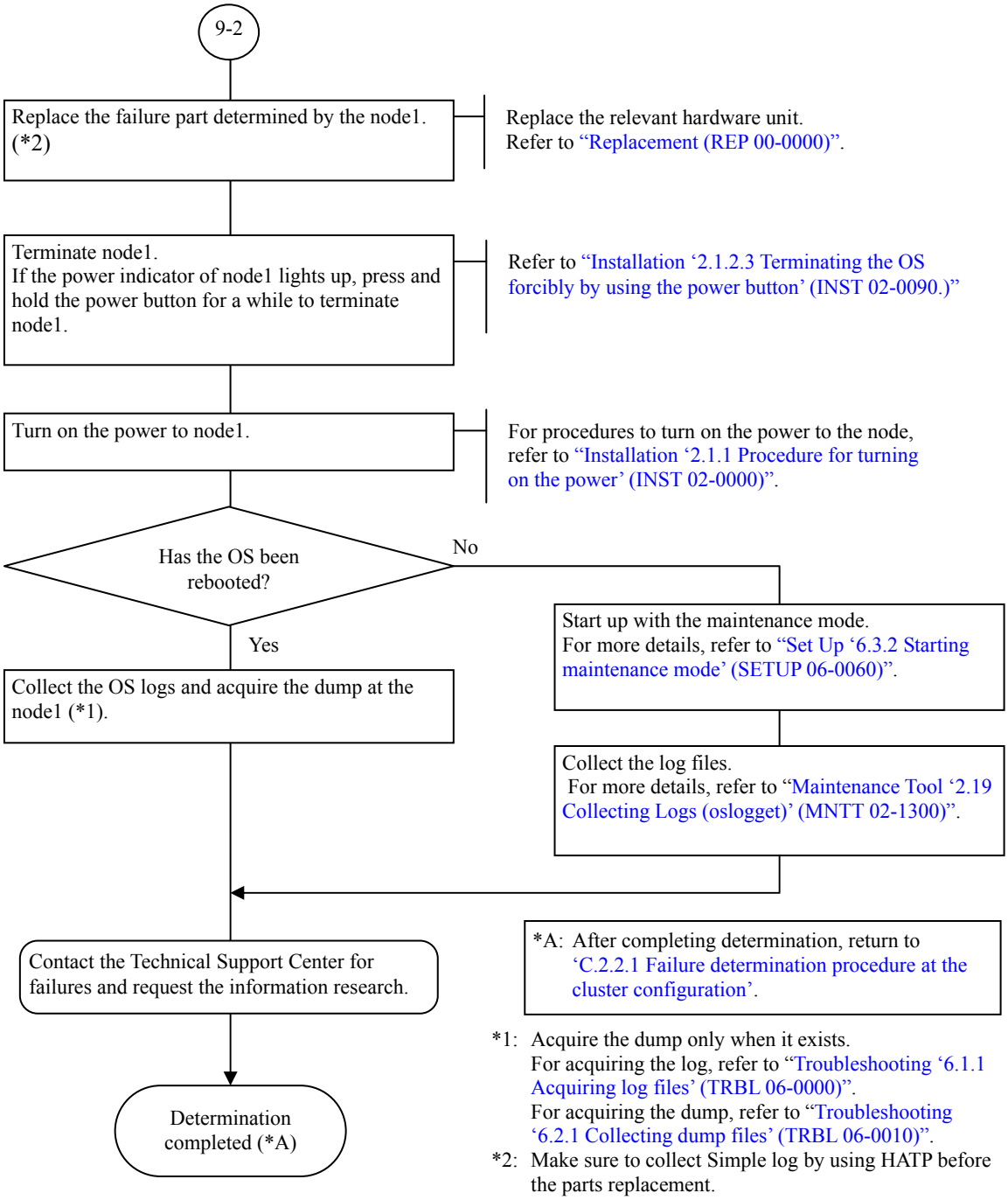

Figure C.2.3.2.2-9 Flow of Management Network Failure Determination (3/6)

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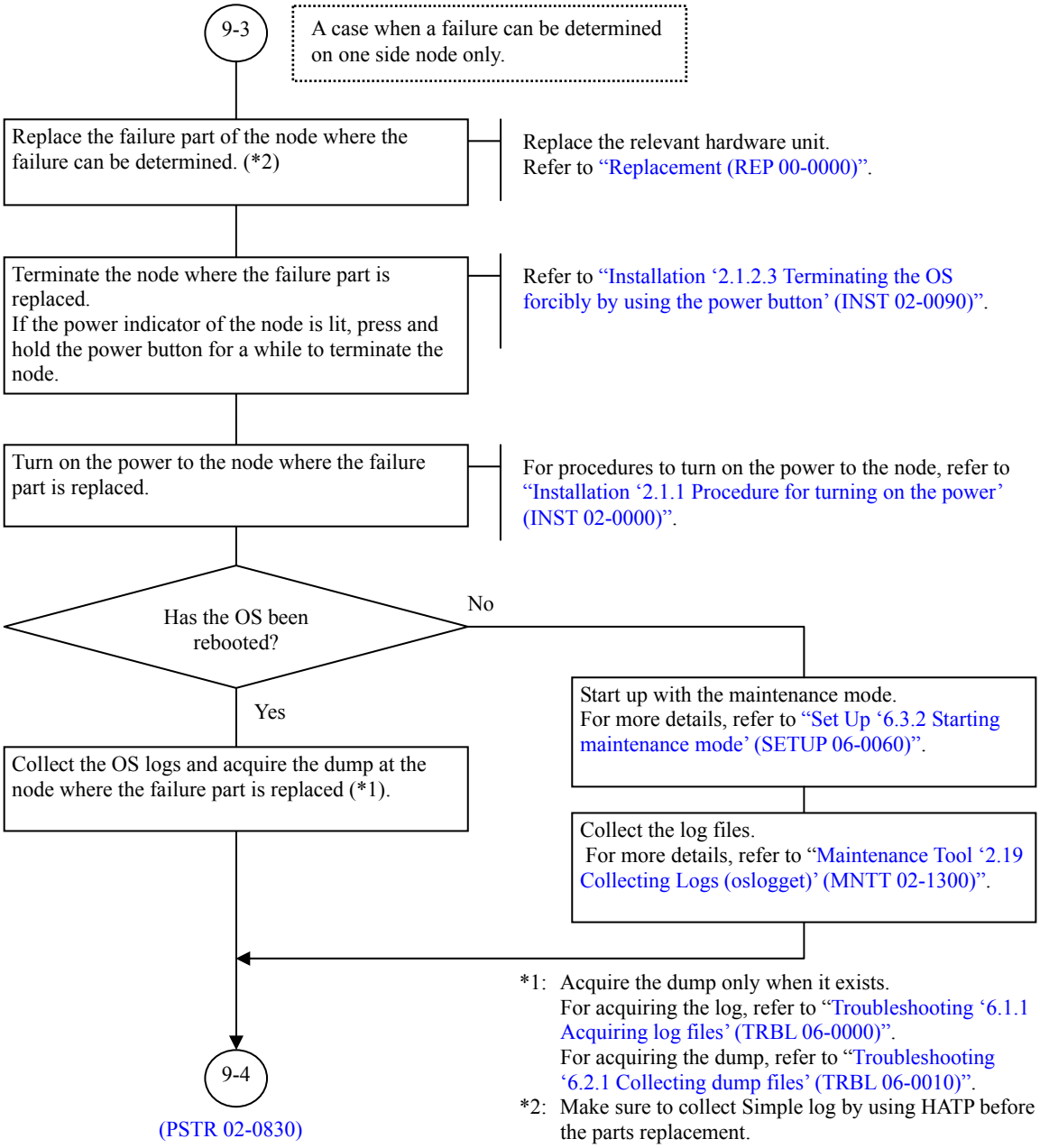

Figure C.2.3.2.2-9 Flow of Management Network Failure Determination (4/6)

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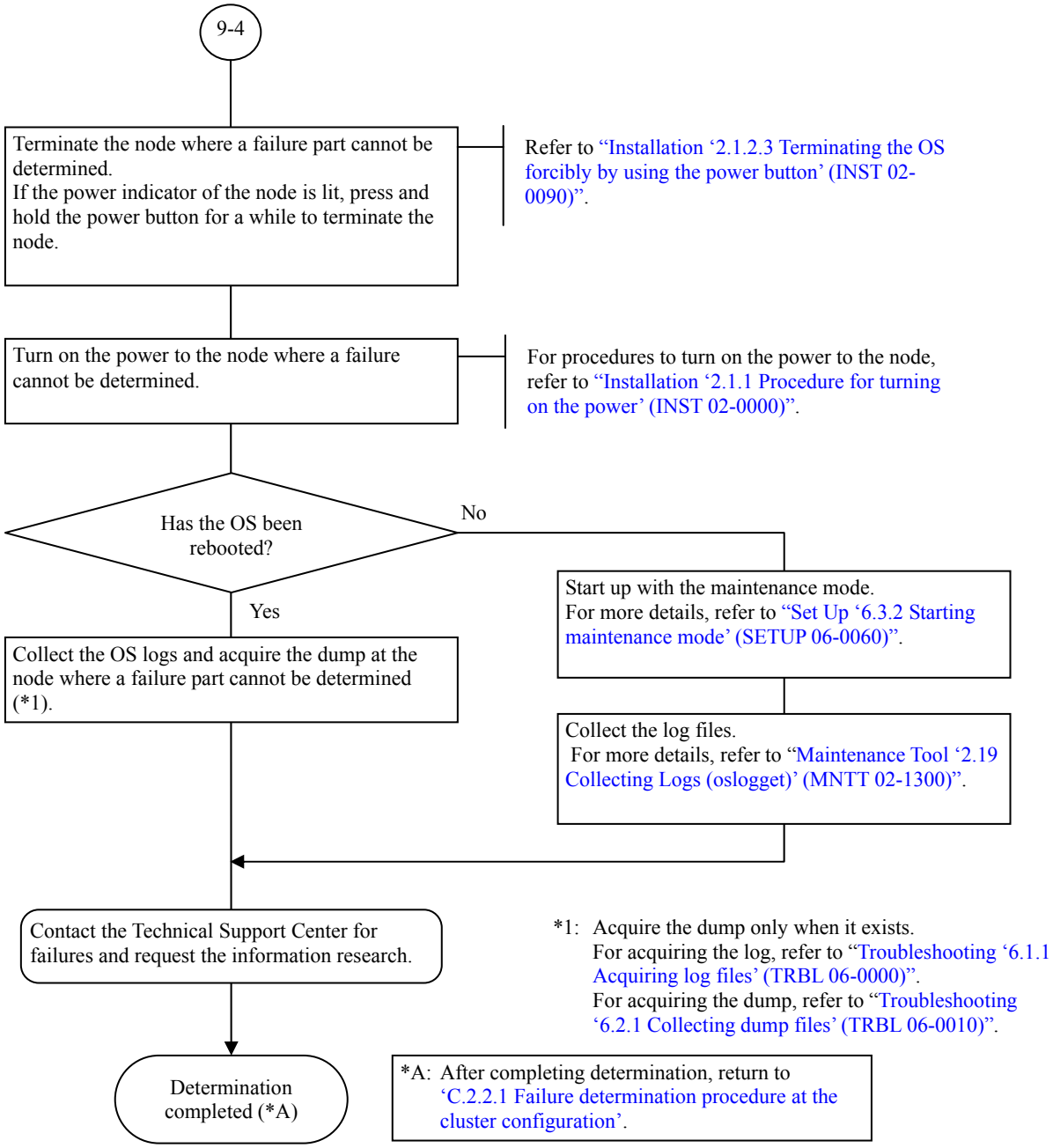

Figure C.2.3.2.2-9 Flow of Management Network Failure Determination (5/6)

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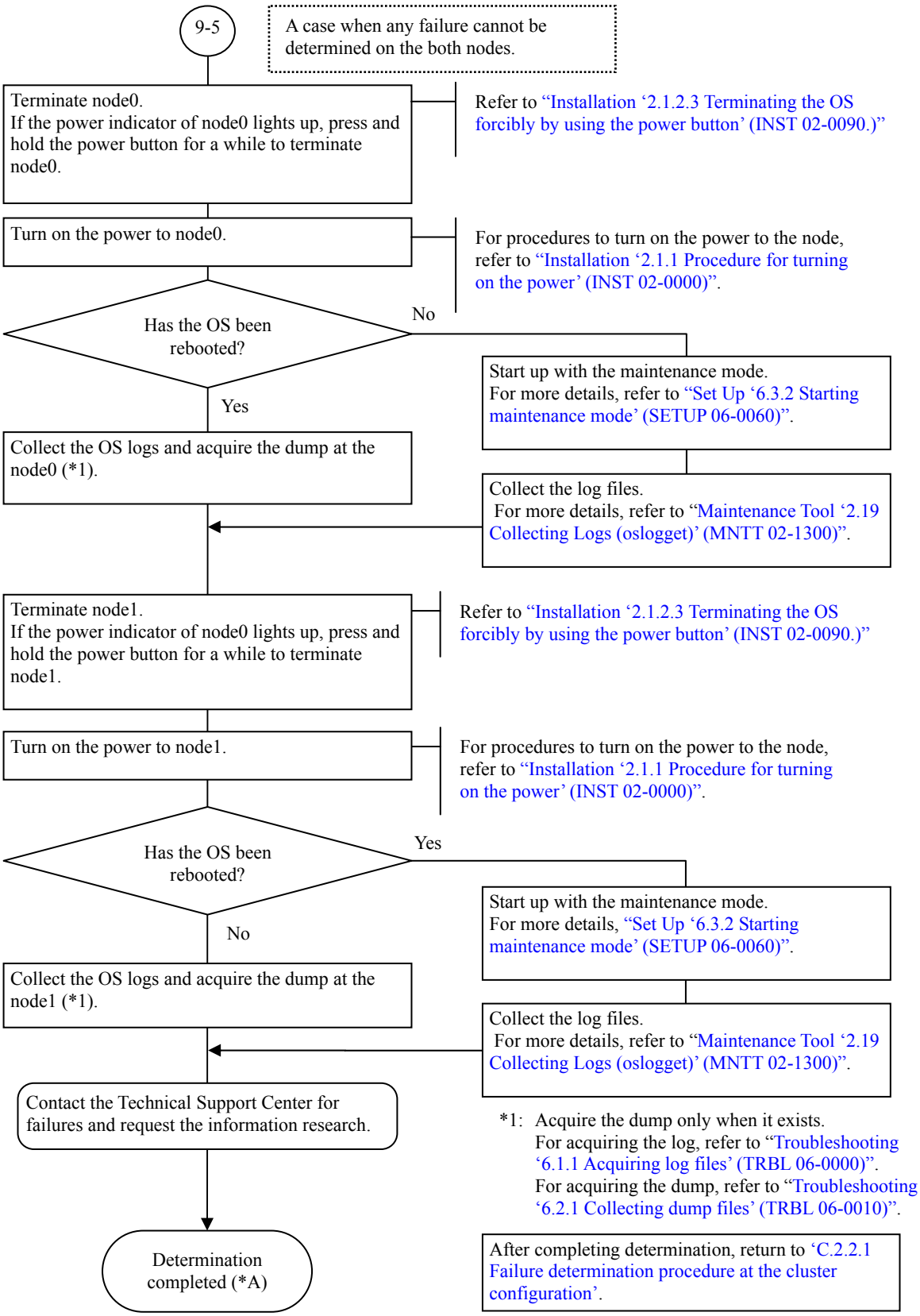

Figure C.2.3.2.2-9 Flow of Management Network Failure Determination (6/6)

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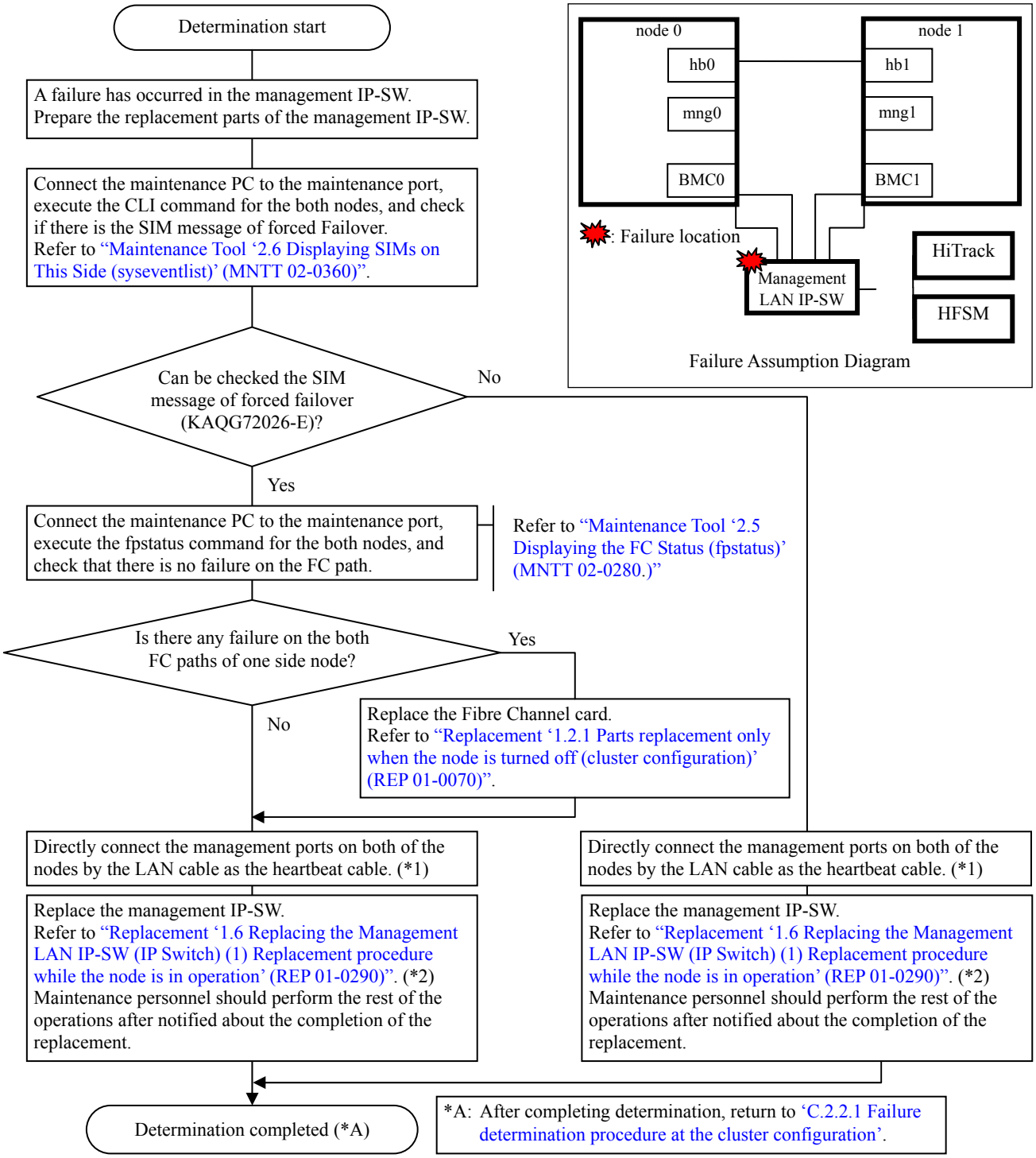
(10) Failure in the management IP-SW



*1: Remove the LAN cable connecting between the management port on the node 0 and the management LAN IP-SW from the management LAN IP-SW, and then connect to the management port on the node 1.

*2: Before executing the procedure (1-3) (c) that is described in the "Replacement '1.6 Replacing the Management LAN IP-SW (IP Switch) (1) Replacement procedure while the node is in operation' (REP 01-0290)", the other side node of the node where the SIM message of forced failover is confirmed is reset. After confirming the startup of the other side node, execute the procedure (1-3) (c) and later.

Figure C.2.3.2.2-10 Flow of Management Network Failure Determination

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C.2.3.2.3 Failure determination in case of node outage

Refer to “Maintenance Manual Hitachi Compute Rack 210HM [System Unit] ‘2.Trouble-shooting’,” and determine a failure on the node in which the OS down, and then return to the procedure described in ‘C.2.3.2.2 Flow of management network failure determination’ to continue the determination operation.

Determining a candidate failure part means that the RC can be determined from the result of HATP, or a failure candidate can be determined from the MAINTENANCE lamp display.

However, when the MAINTENANCE lamp lights up as “01” and it is not dual failure of the embedded HDD, or when there is no problem on the result of the HATP, a failure in the hardware such as on RAID controller might not be detected. In this case, assume that the hardware failure cannot be determined.

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C.2.3.3 Determining the node failure when no failover occurs

The failure determination and the failed part when SIM of failover is not displayed are described below.

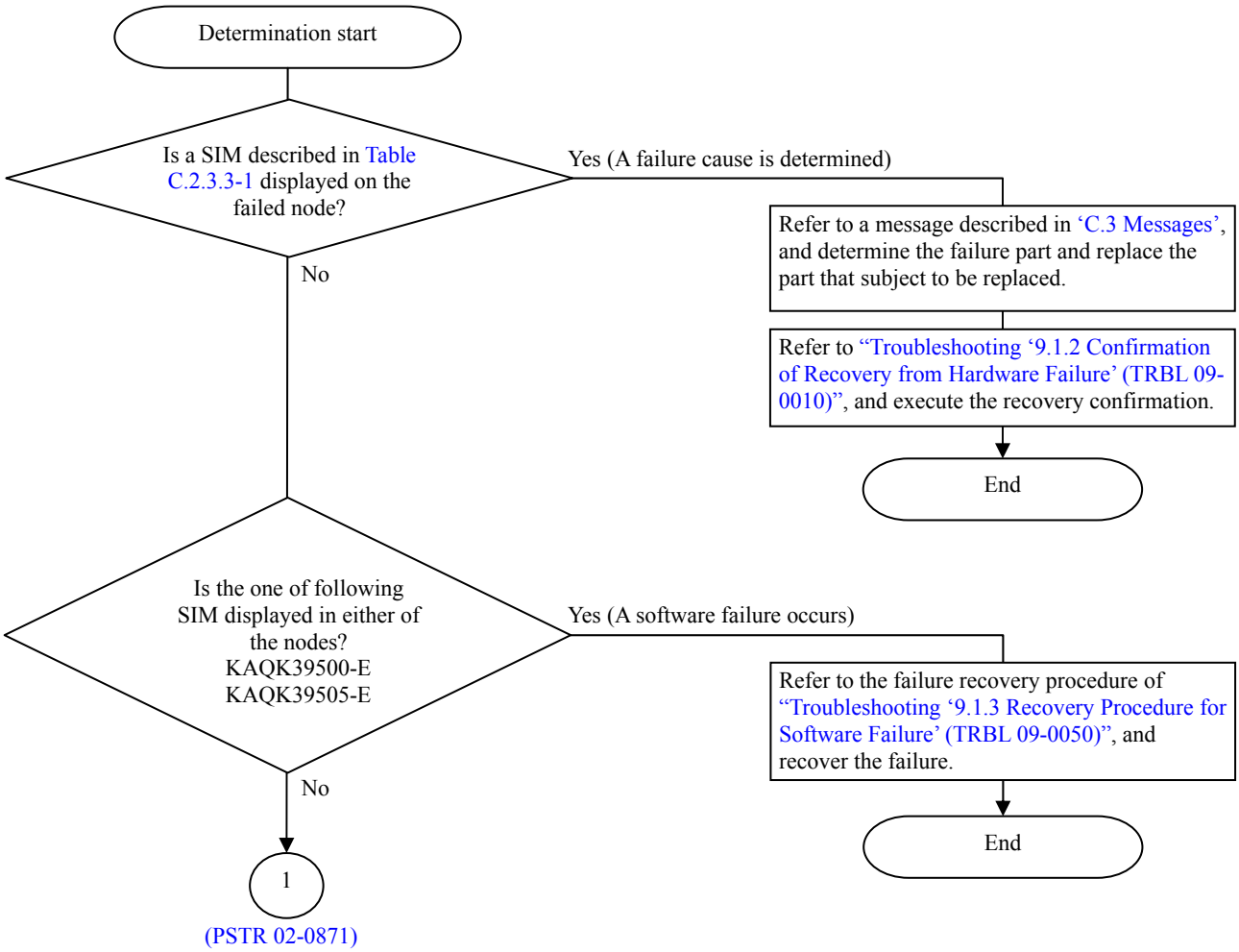

Figure C.2.3.3-1 Determining the node failure when failover has not occurred (1/2)

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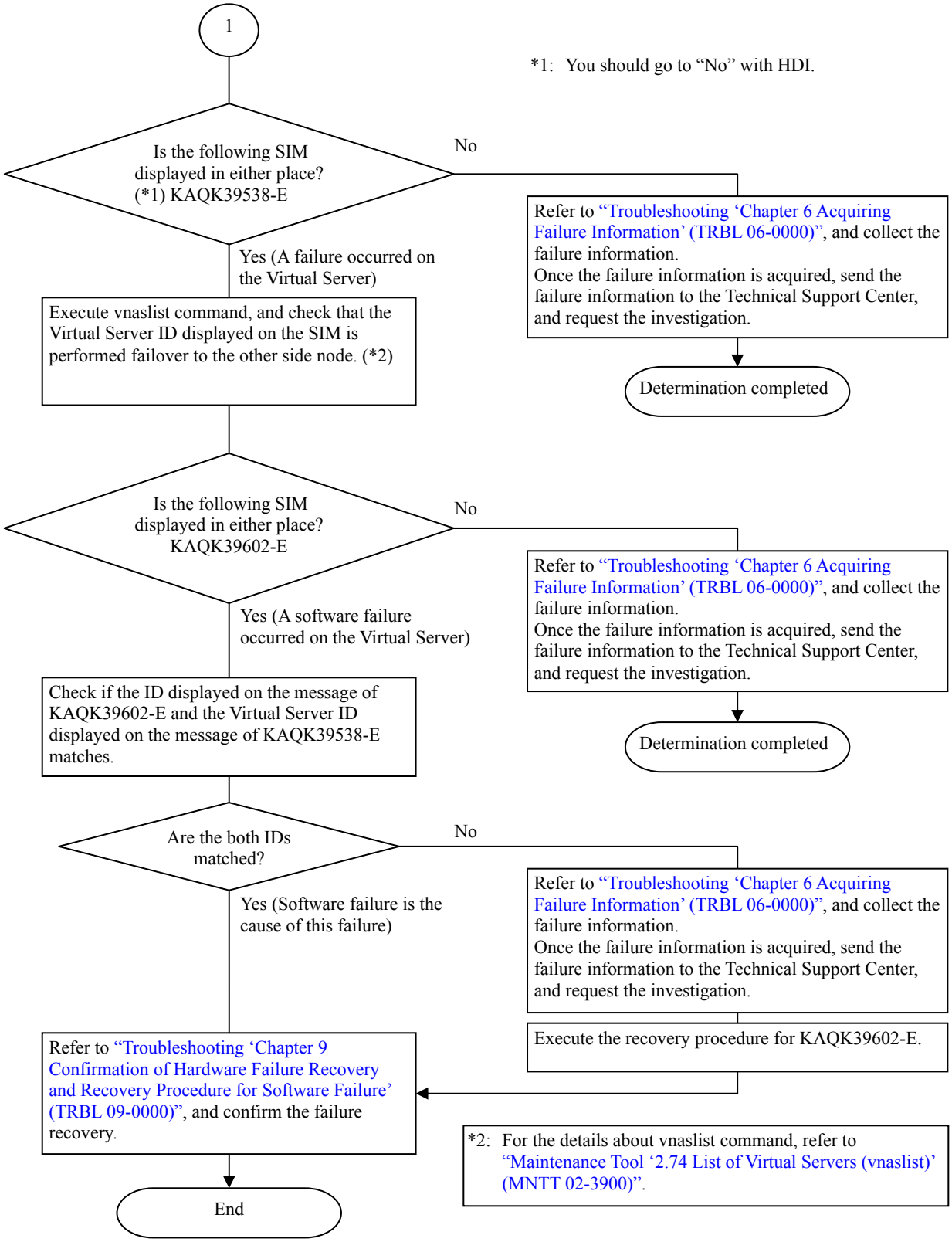

Figure C.2.3.3-1 Determining the node failure when failover has not occurred (2/2)

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Table C.2.3.3-1 Failed parts shown by SIM

#	SIM	Lamp status	Checking the status by the hwstatus command (*1)	Failed part
1	KAQG72012-W	—	Is the Heartbeat LAN port status “Link down”?	Heartbeat LAN port or Heartbeat LAN cable (*2) (*3)
2	KAQG81003-W	—	Is the port status “Link down”?	Extension NIC port or cable (*2)
3	KAQK30801-E	—	—	Determine a failure part from the RC described in SIM and the continuous log (*4)
4	KAQK39504-E	—	Is the status of all ports of NIC “Link down”?	—
5	KAQK39527-E	—	—	Pool exhaustion (*5)

*1: For the hwstatus command, refer to ‘B.3.1 Displaying the Hardware Status (hwstatus)’.
*2: When it is not recovered even if the cable is replaced, it is a port failure.
*3: In case of a port failure, ping from the management PC or maintenance PC, and specify which of the nodes has the port failure.
*4: For the determination from the RC and the continuous log, refer to “Maintenance Manual Hitachi Compute Rack 210HM [System Unit]”.
*5: Ask the system administrator to recover the pool exhaustion.

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C.2.3.4 Determining the node failure when failover occurred

The failure determination and the failed part when SIM of failover is displayed are described.
HDI does not support Virtual Server. Therefore, even if the term "Virtual Server" appears in the flow, assume that "Virtual Server" does not exist.

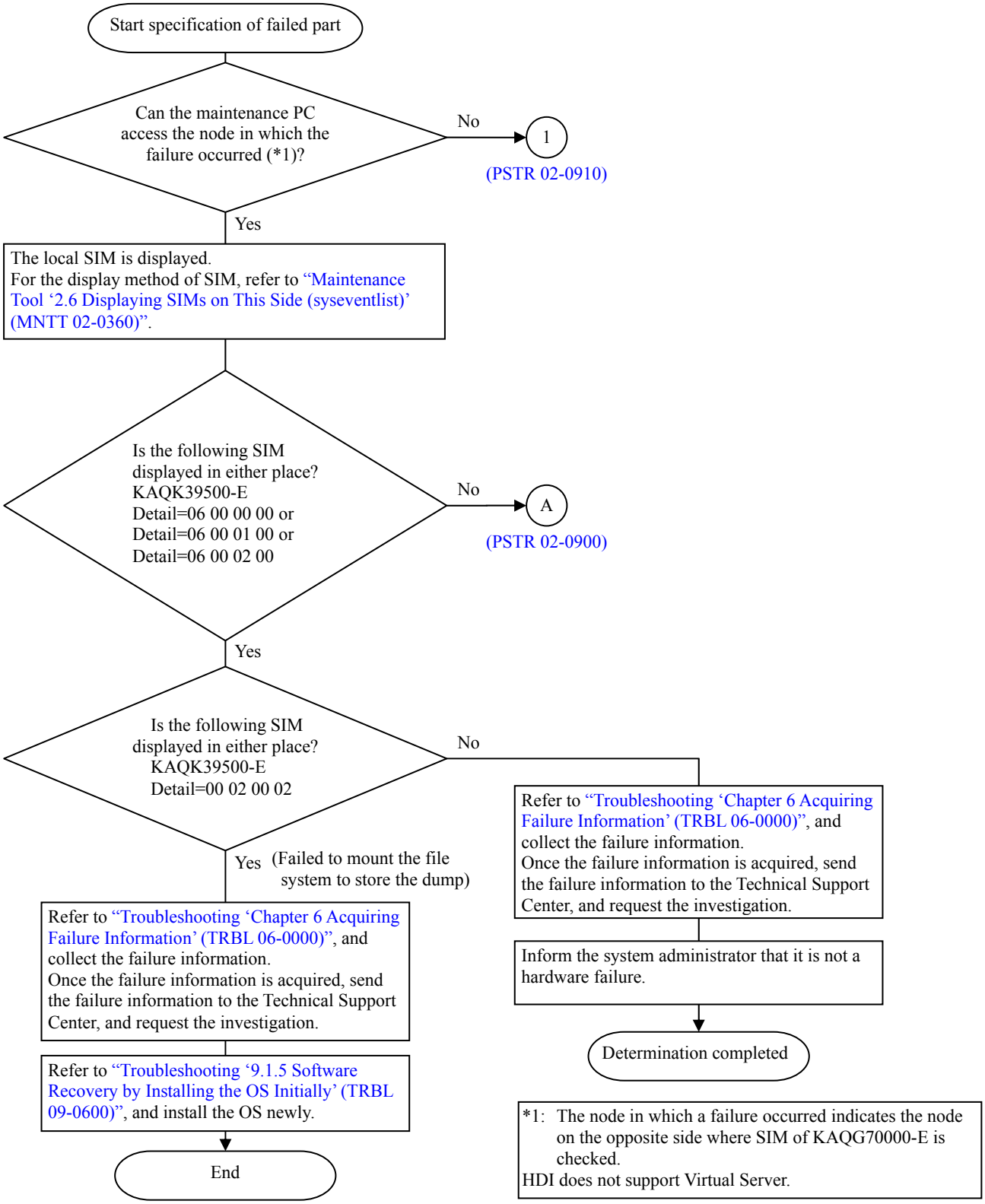

Figure C.2.3.4-1 Determining the node failure when failover occurred (1/7)

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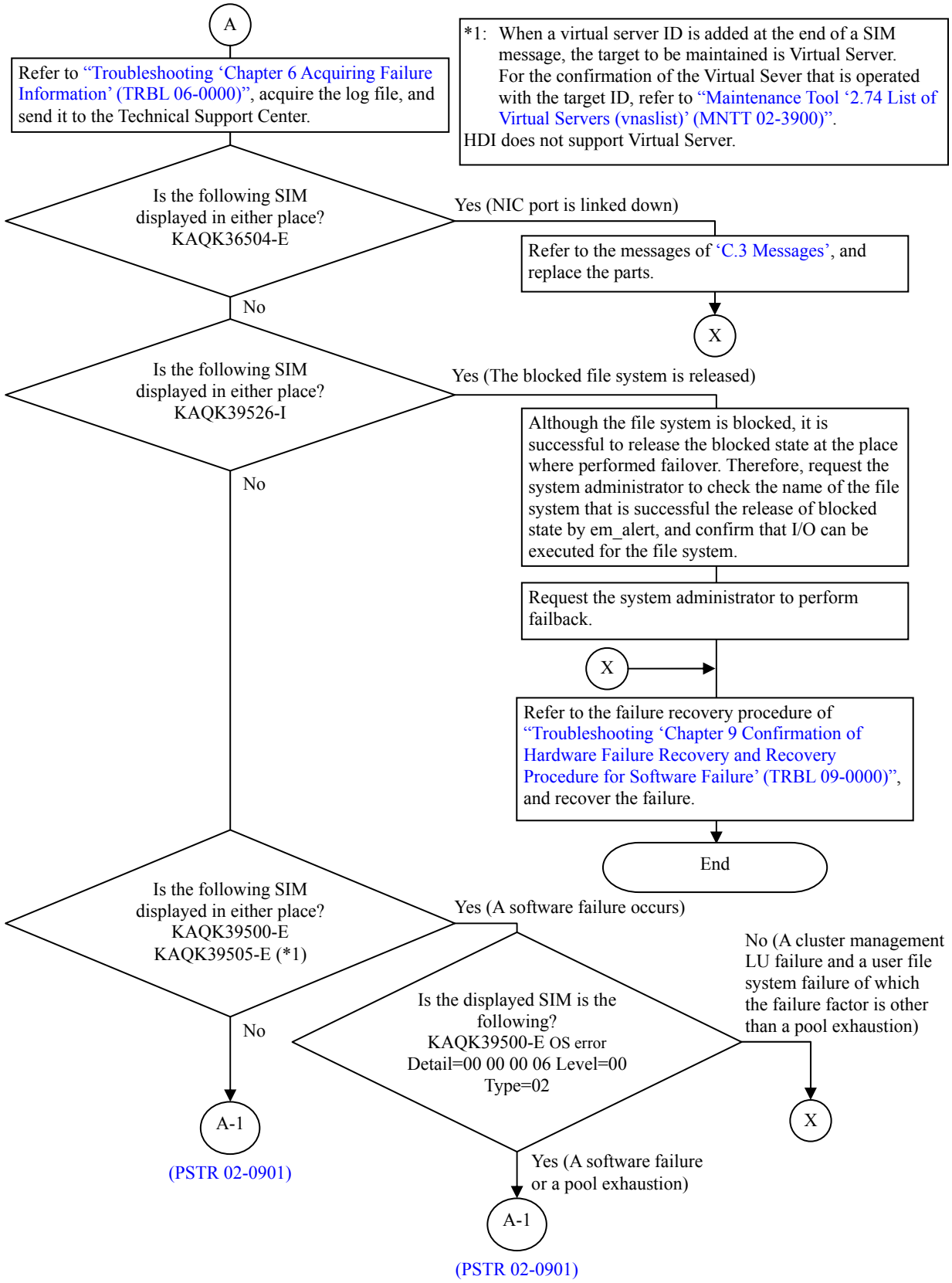

Figure C.2.3.4-1 Determining the node failure when failover occurred (2/7)

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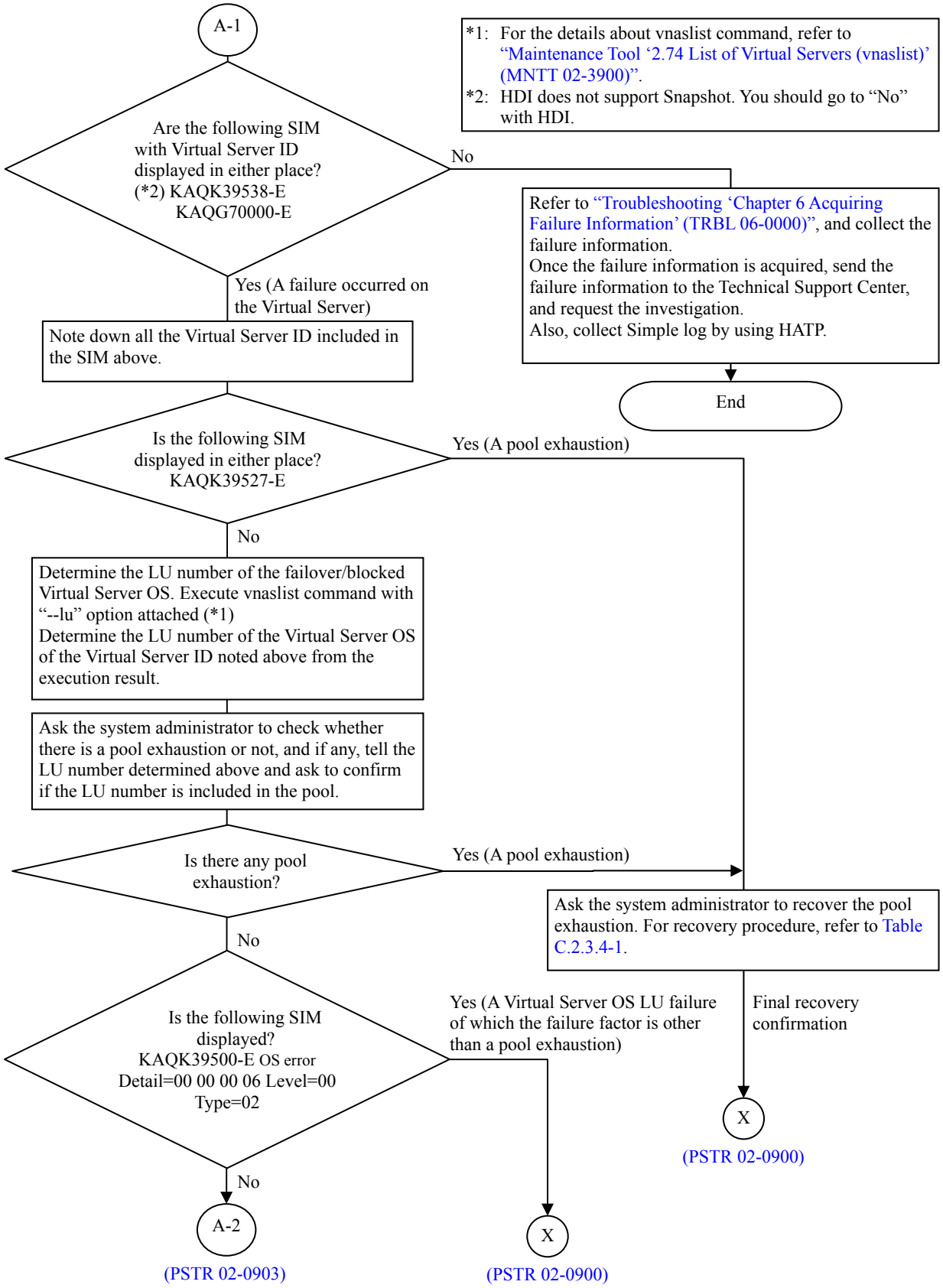

Figure C.2.3.4-1 Determining the node failure when failover has not occurred (3/7)

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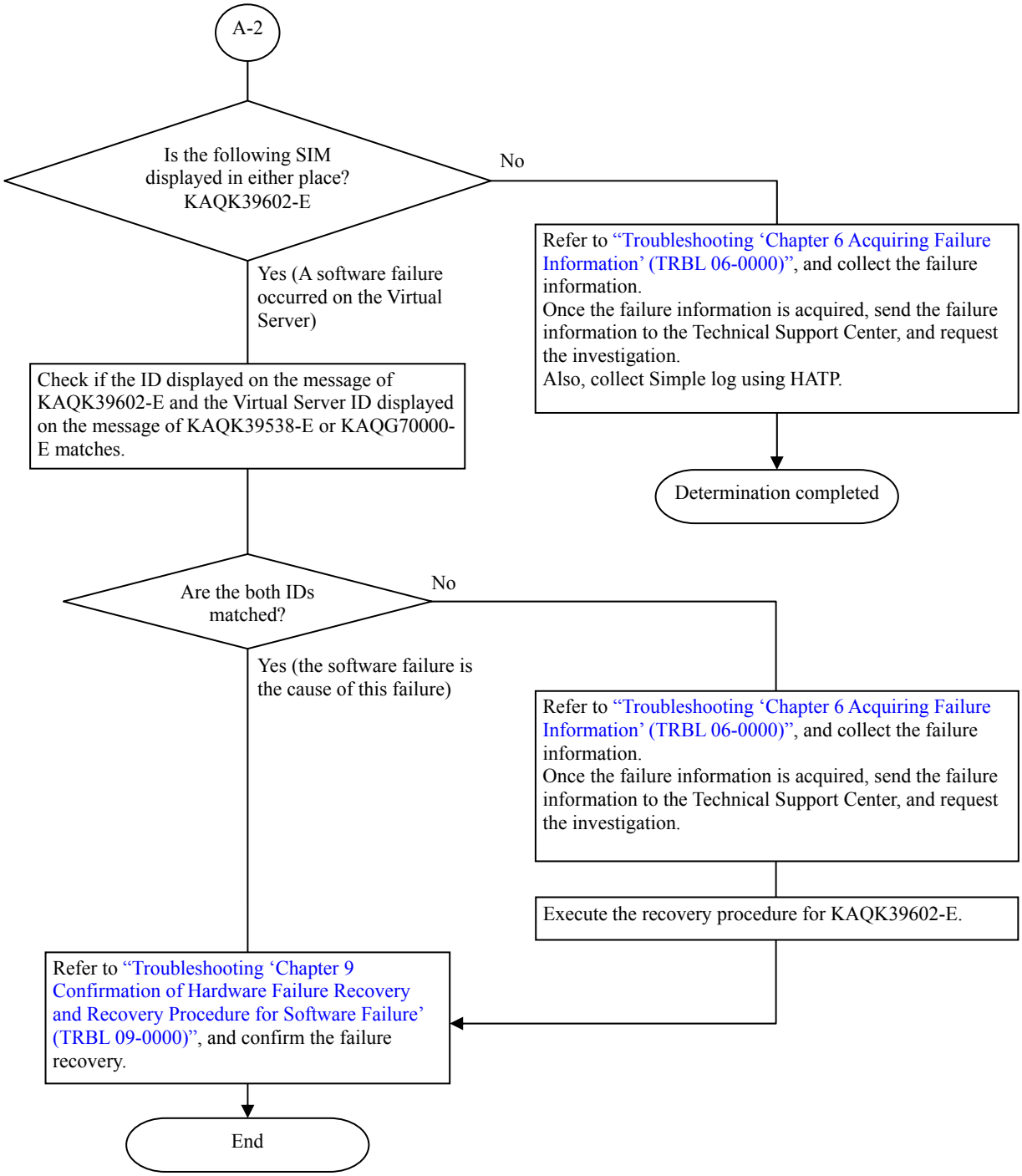

Figure C.2.3.4-1 Determining the node failure when failover occurred (4/7)

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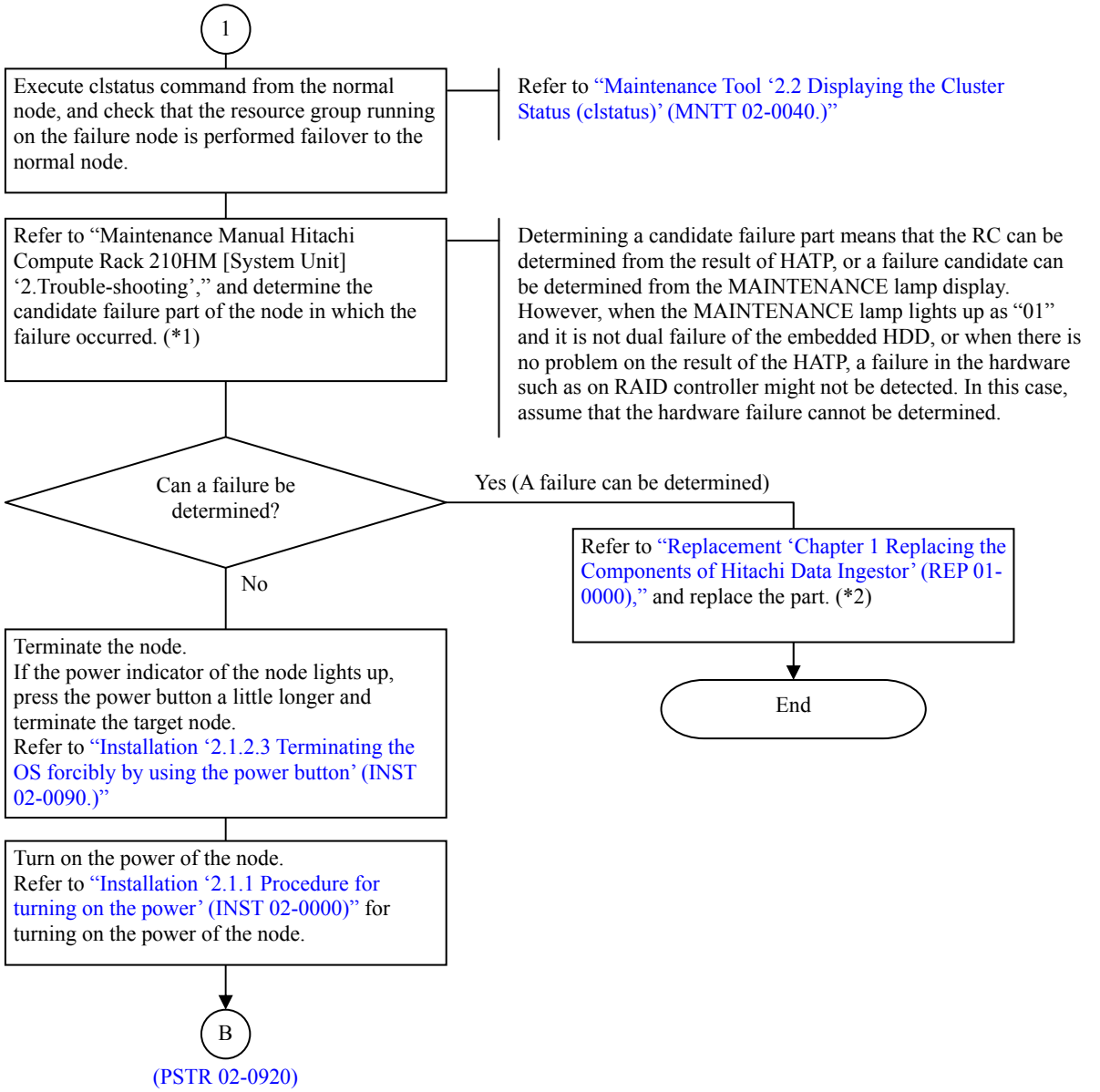

*1: There is no problem to reboot the failed node for executing HATP.
*2: Make sure to collect Simple log by using HATP before the parts replacement.

Figure C.2.3.4-1 Determining the node failure when failover occurred (5/7)

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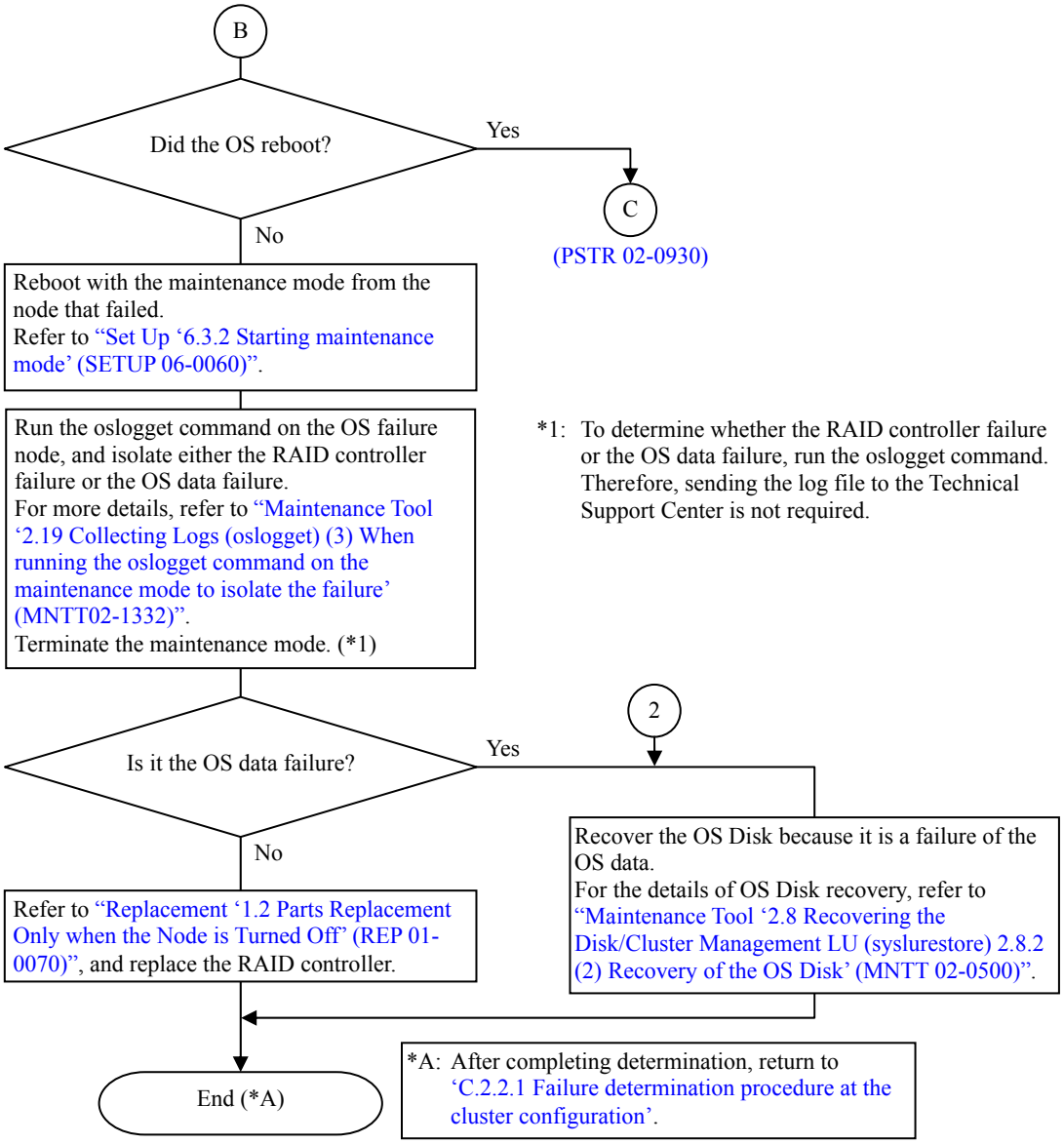

Figure C.2.3.4-1 Determining the node failure when failover occurred (6/7)

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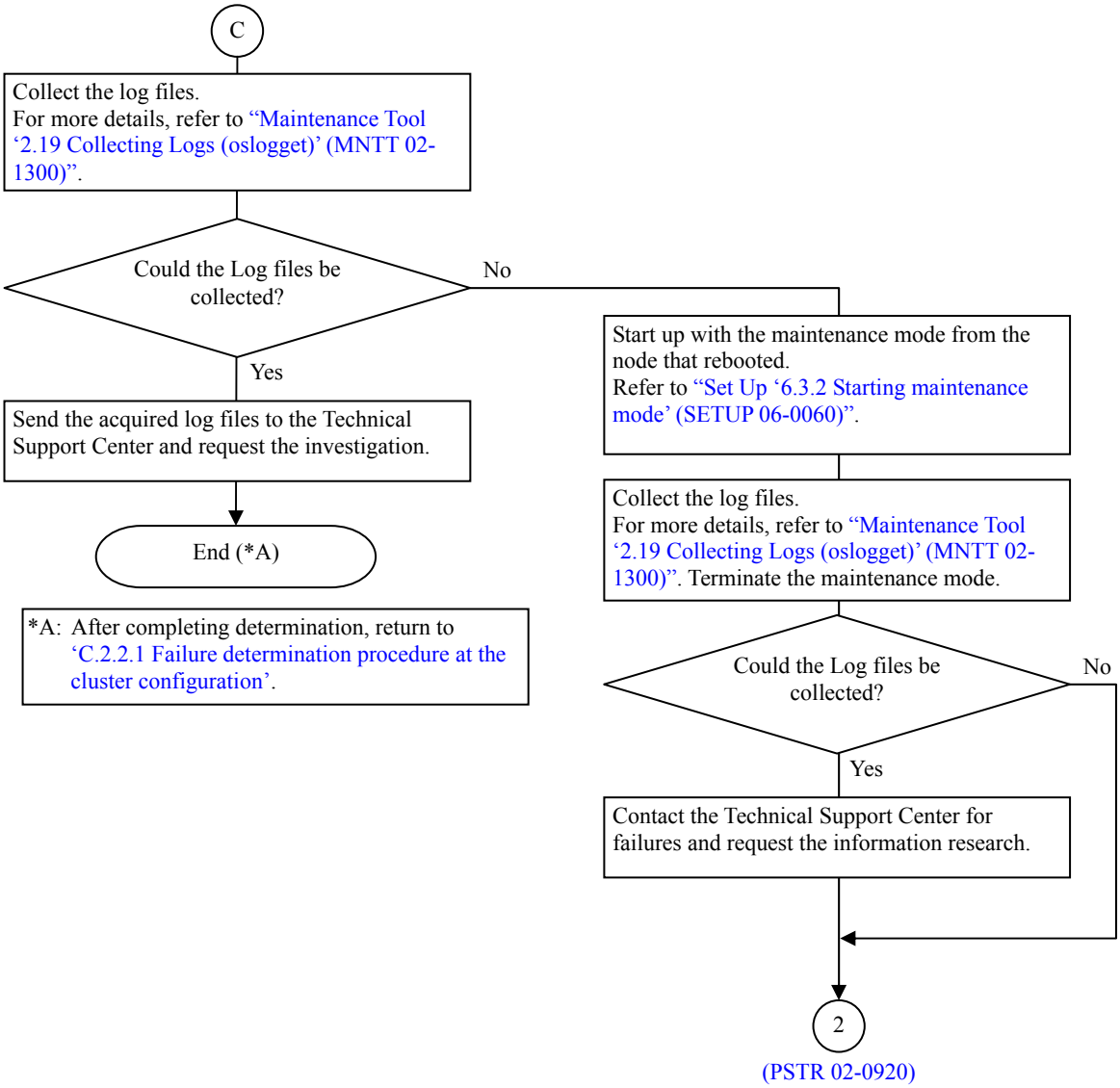

Figure C.2.3.4-1 Determining the node failure when failover occurred (7/7)

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C.2.3.5 Determination of node failure in the single node configuration

HDI does not support.

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C.2.3.6 Determination of network failure

This section shows troubleshooting of SIM message from which it is difficult to determine a failure part in the case of displaying SIM about the network failure.

(1) In the case of the KAQG72012-W

Describe troubleshooting procedure as follow in the case of the “KAQG72012-W Communication via the main heartbeat cable was interrupted.” was displayed.

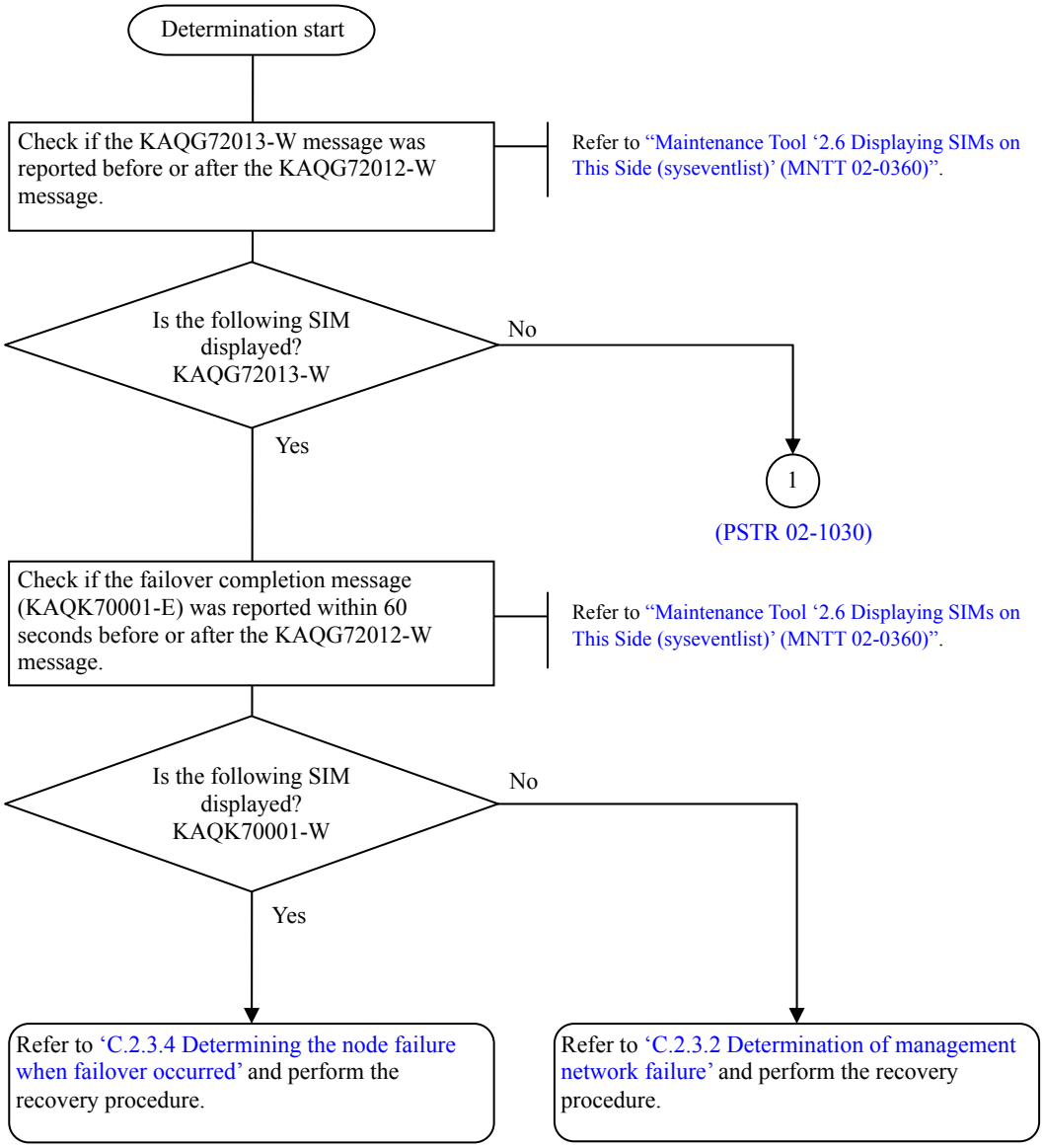

Figure C.2.3.6-1 Determination of network failure (KAQG72012-W) (1/2)

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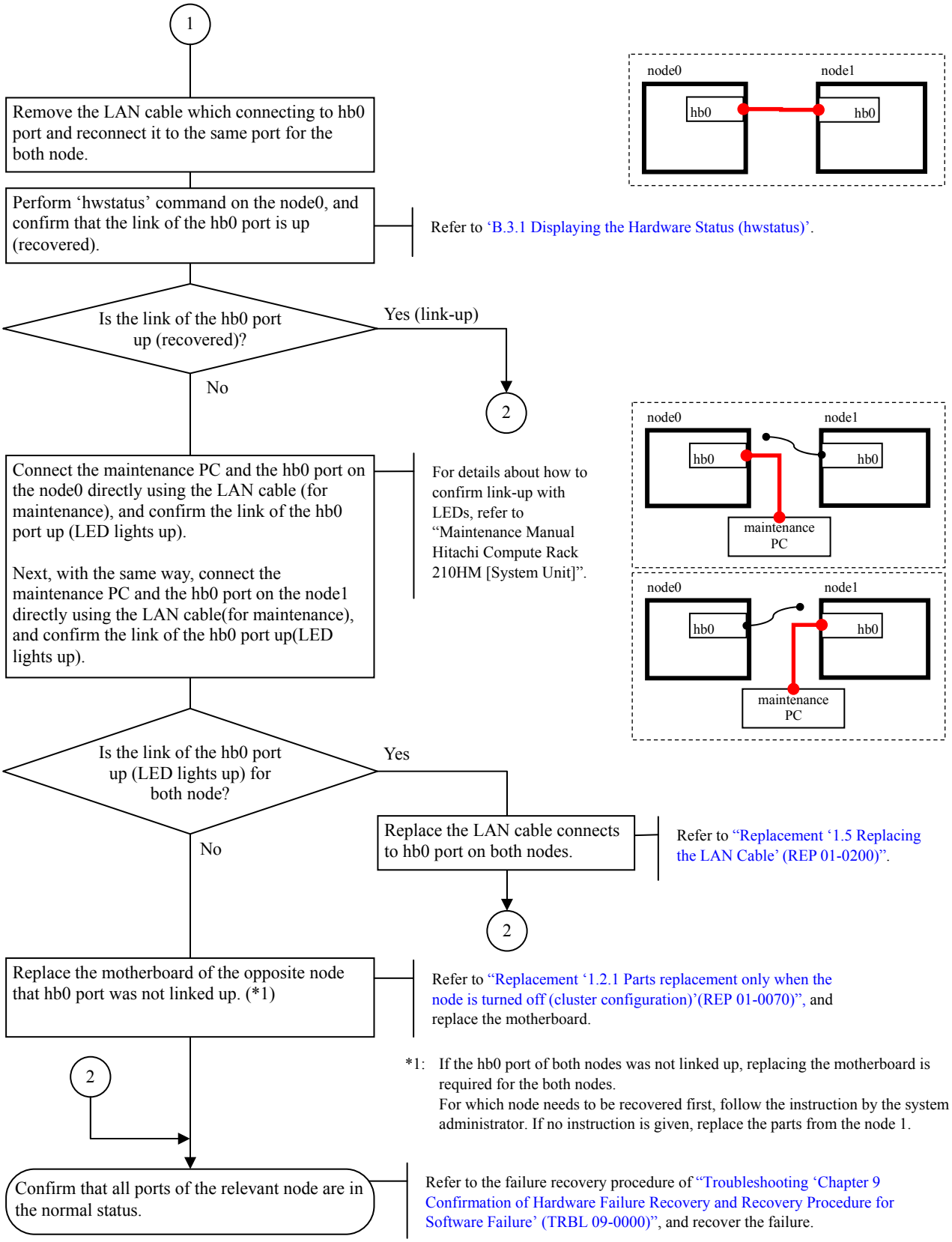

Figure C.2.3.6-1 Determination of network failure (KAQG72012-W) (2/2)

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(2) In the case of the KAQG81003-W

Describe troubleshooting procedure as follow in the case of the "KAQG81003-W Trunking driver: One or more subdevices are down. <*master-device-name*>:<*subdevice-name*>,<*subdevice-name*>…" was displayed.

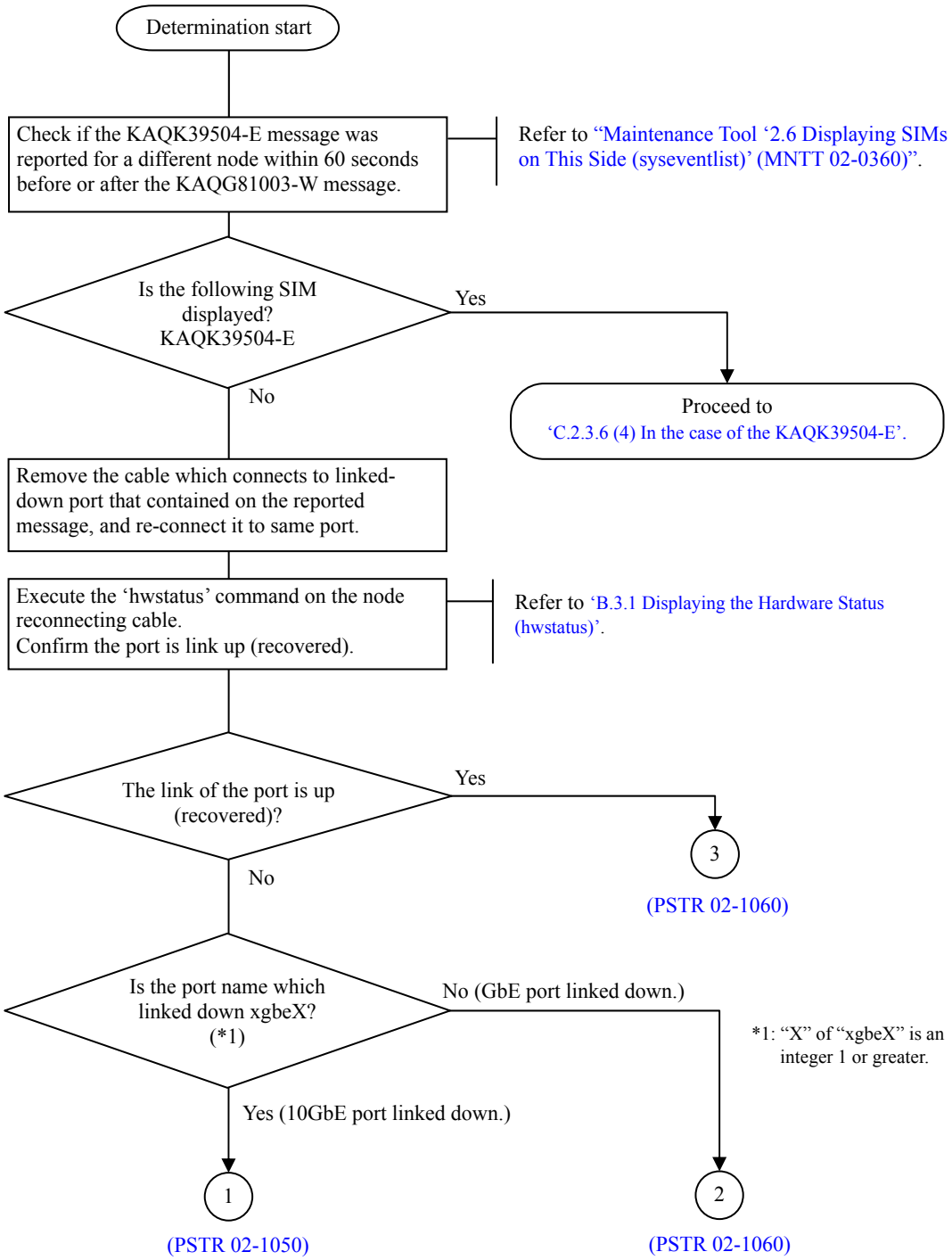

Figure C.2.3.6-2 Determination of network failure (KAQG81003-W) (1/3)

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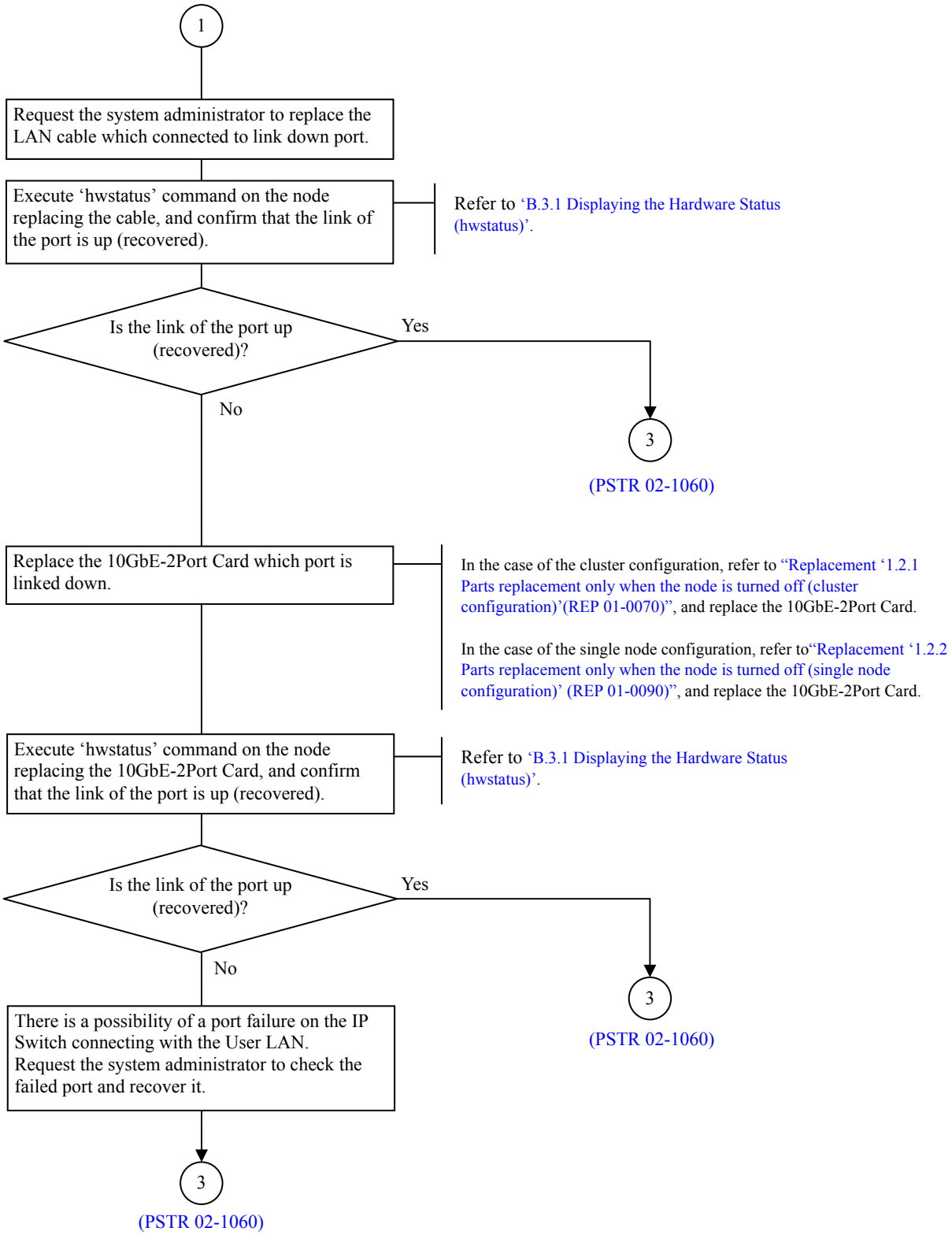

Figure C.2.3.6-2 Determination of network failure (KAQG81003-W) (2/3)

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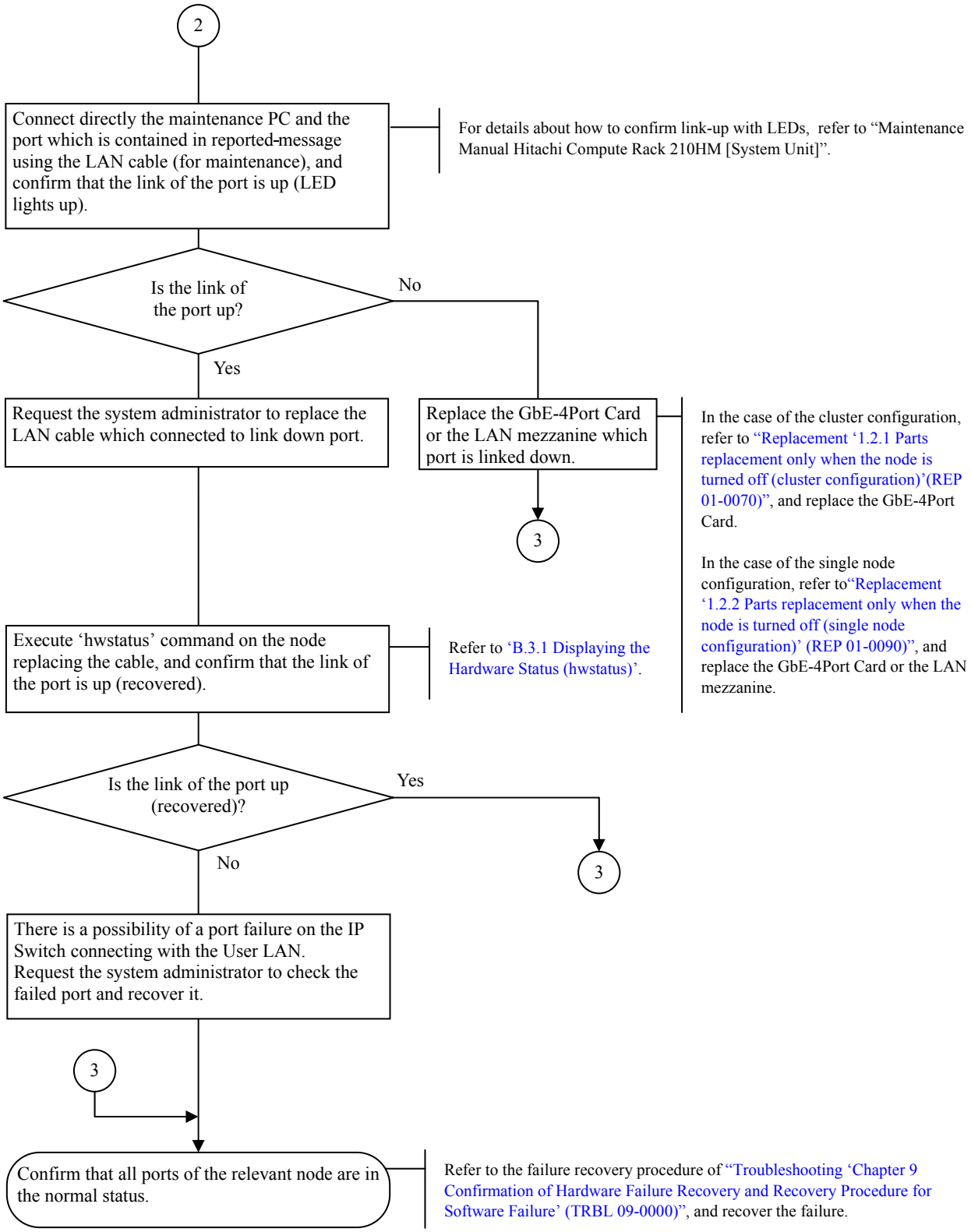

Figure C.2.3.6-2 Determination of network failure (KAQG81003-W) (3/3)

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(3) In the case of the KAQK36504-W

Describe troubleshooting procedure as follow in the case of the "KAQK36504-W NIC: Link down detected(<*interface-name*>)" was displayed.

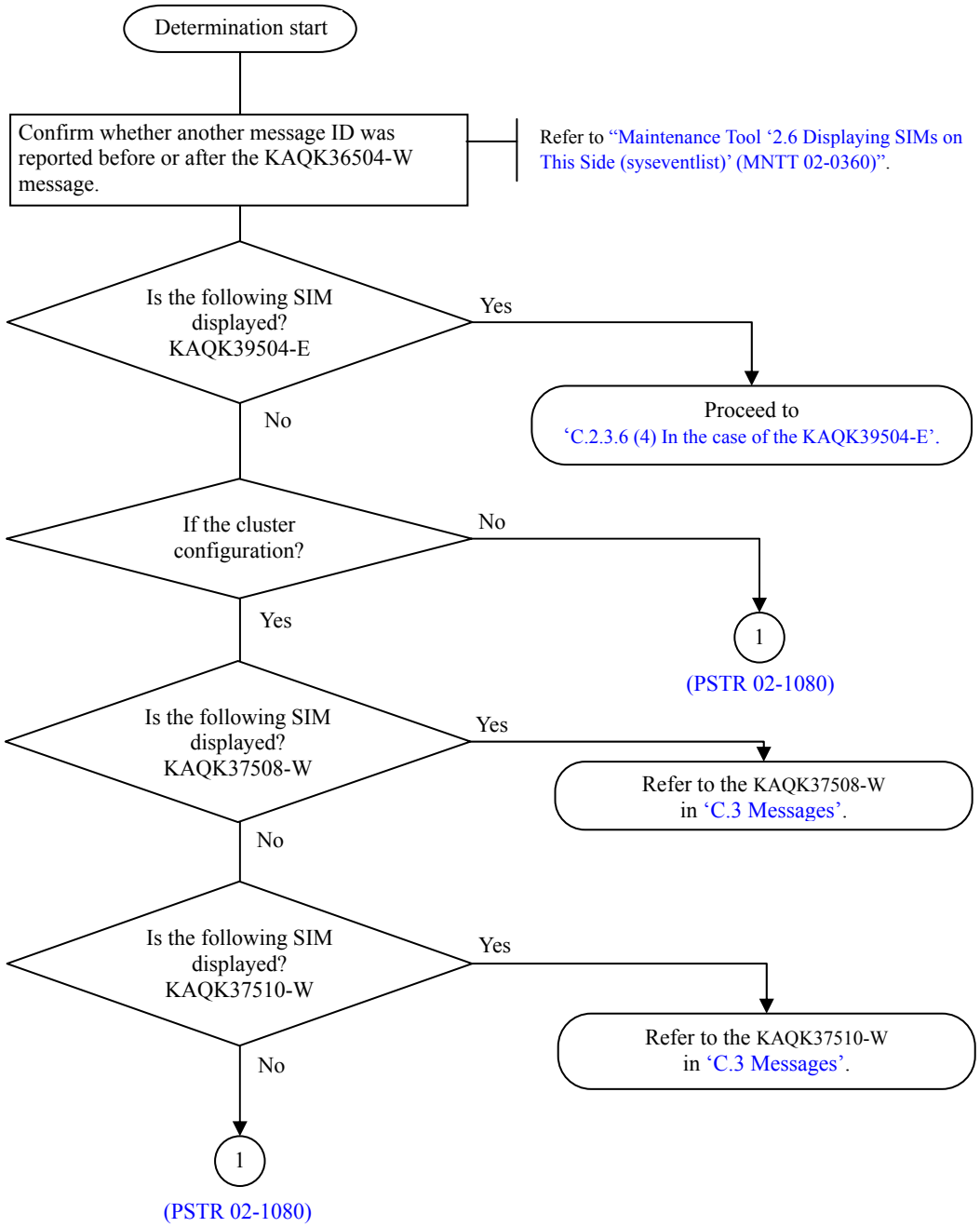

Figure C.2.3.6-3 Determination of network failure (KAQK36504-W) (1/4)

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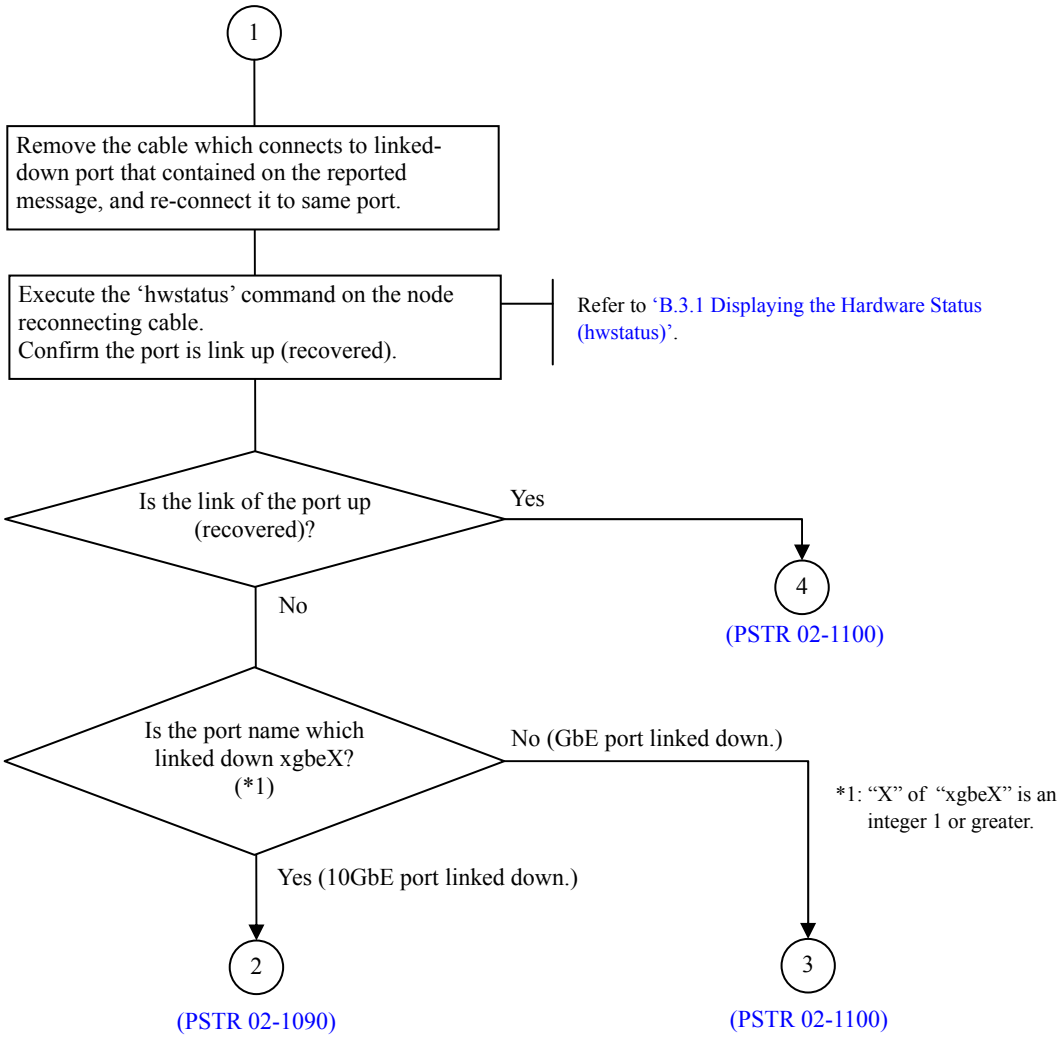

Figure C.2.3.6-3 Determination of network failure (KAQK36504-W) (2/4)

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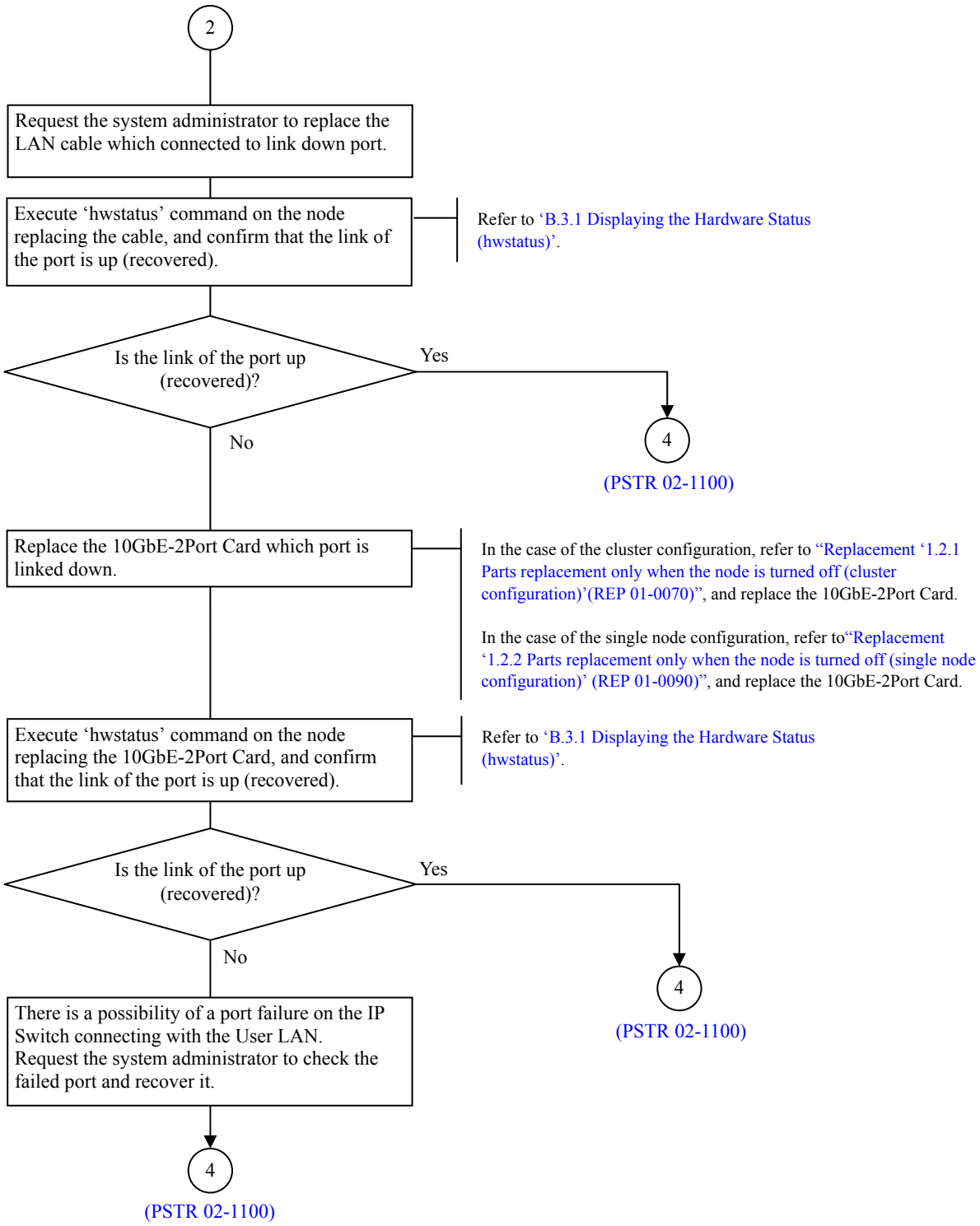

Figure C.2.3.6-3 Determination of network failure (KAQK36504-W) (3/4)

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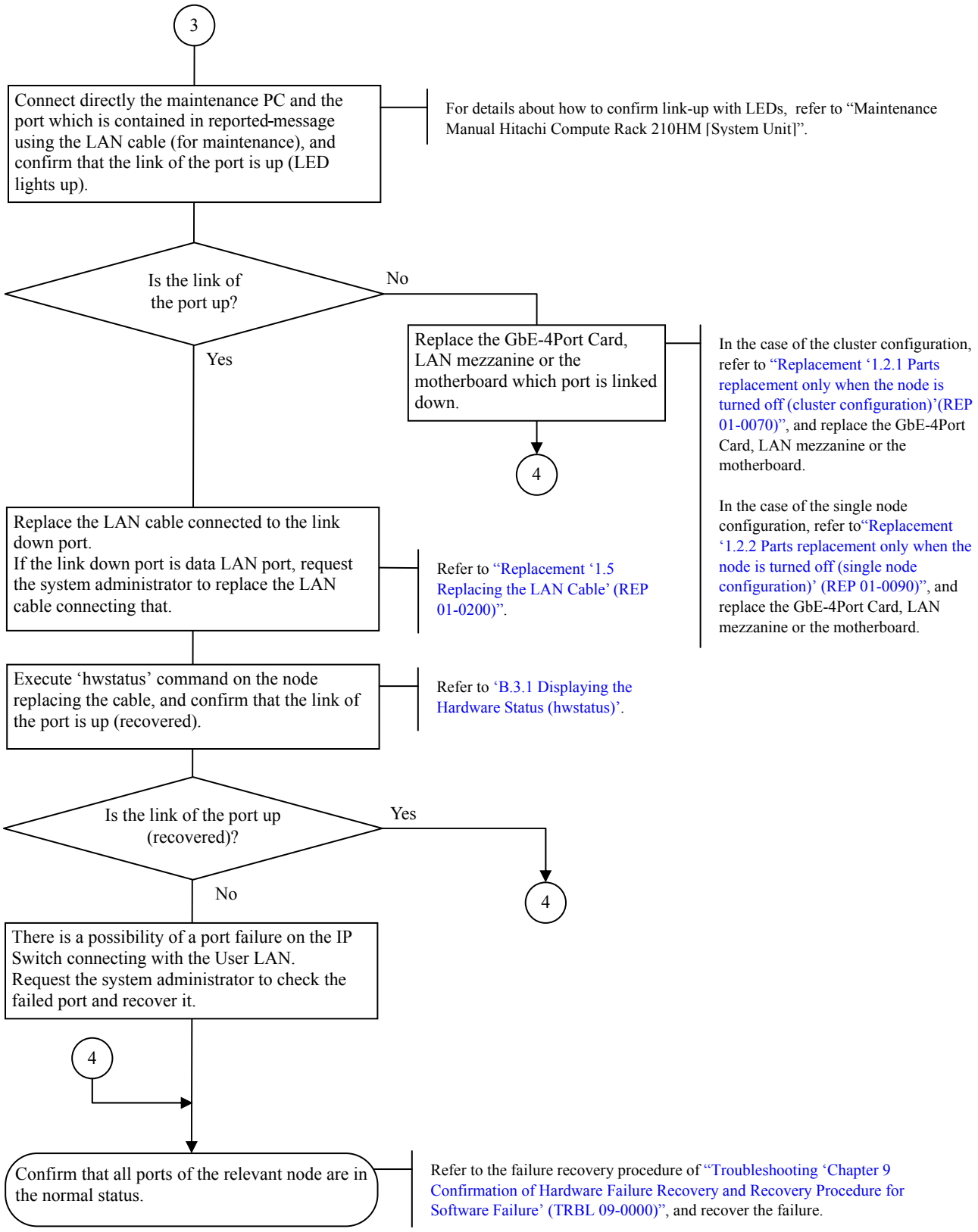

Figure C.2.3.6-3 Determination of network failure (KAQK36504-W) (4/4)

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(4) In the case of the KAQK39504-E

Describe troubleshooting procedure as follow in the case of the “KAQK39504-E Link down in Front-end LAN.” was displayed.

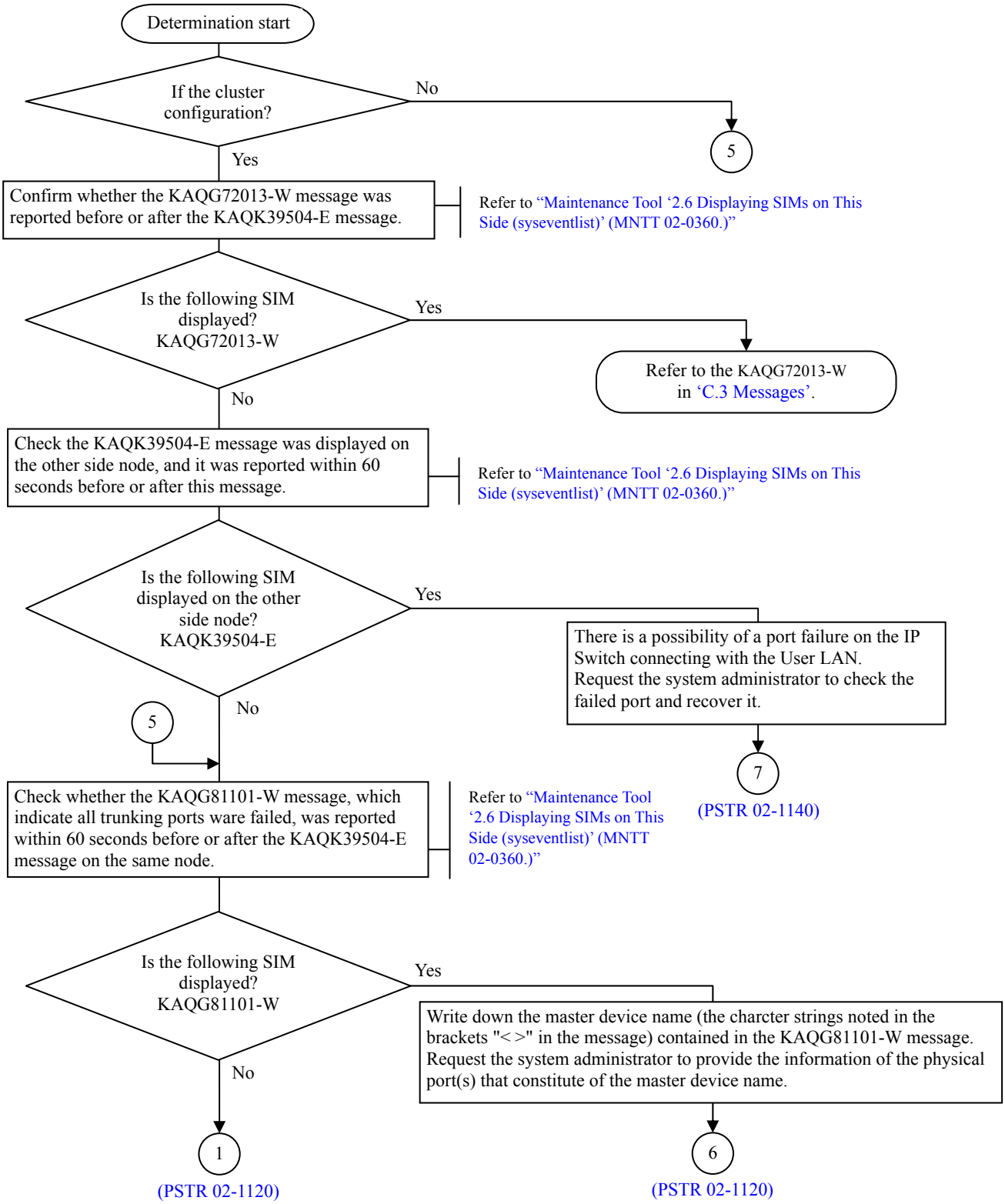

Figure C.2.3.6-4 Determination of network failure (KAQK39504-E) (1/4)

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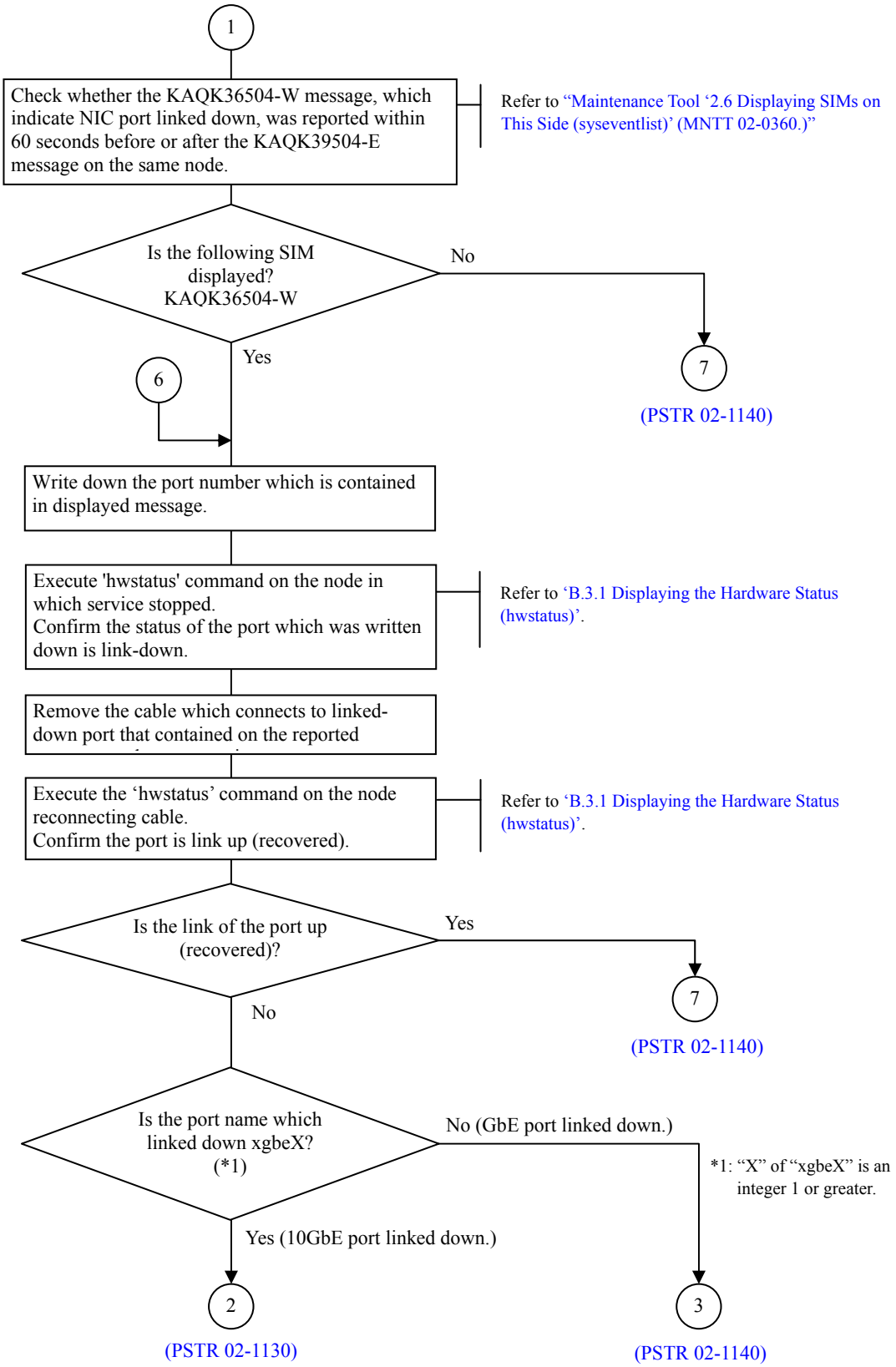

Figure C.2.3.6-4 Determination of network failure (KAQK39504-E) (2/4)

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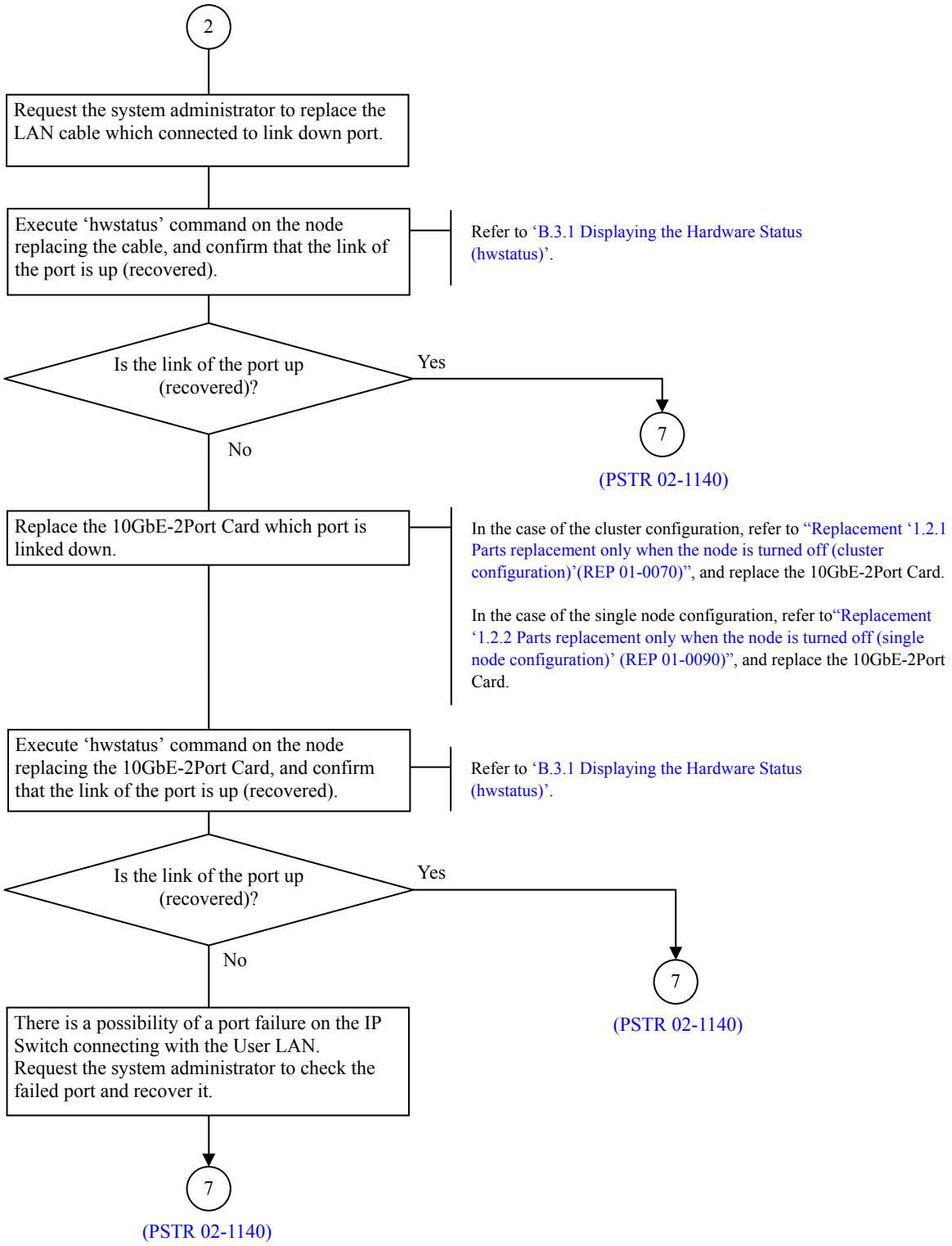

Figure C.2.3.6-4 Determination of network failure (KAQK39504-E) (3/4)

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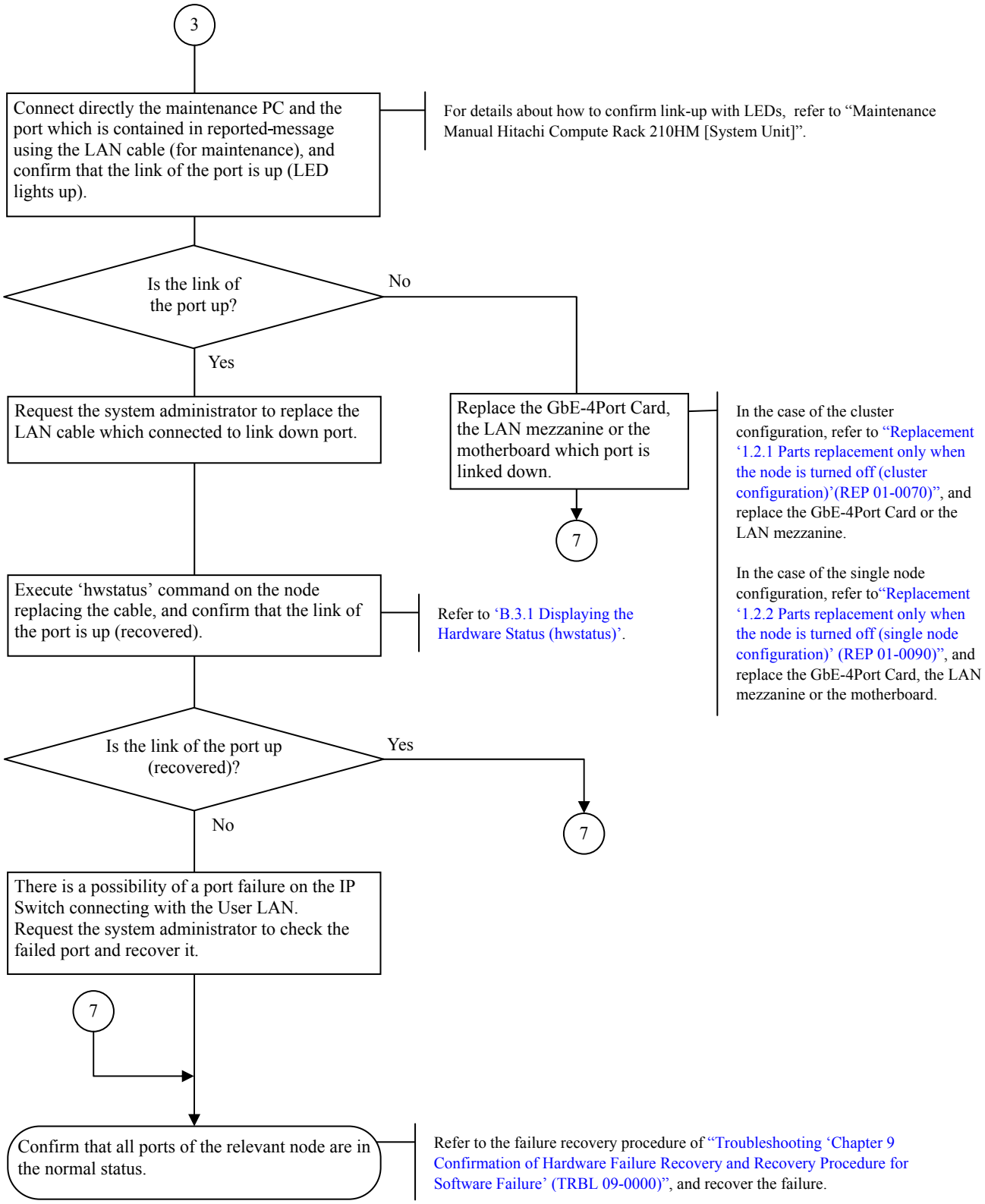

Figure C.2.3.6-4 Determination of network failure (KAQK39504-E) (4/4)

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C.2.4 Diagnosis for OS Boot Failure

This section describes how to diagnose when the replaced part failure or other failure cause the OS boot failure after parts replacement operation.

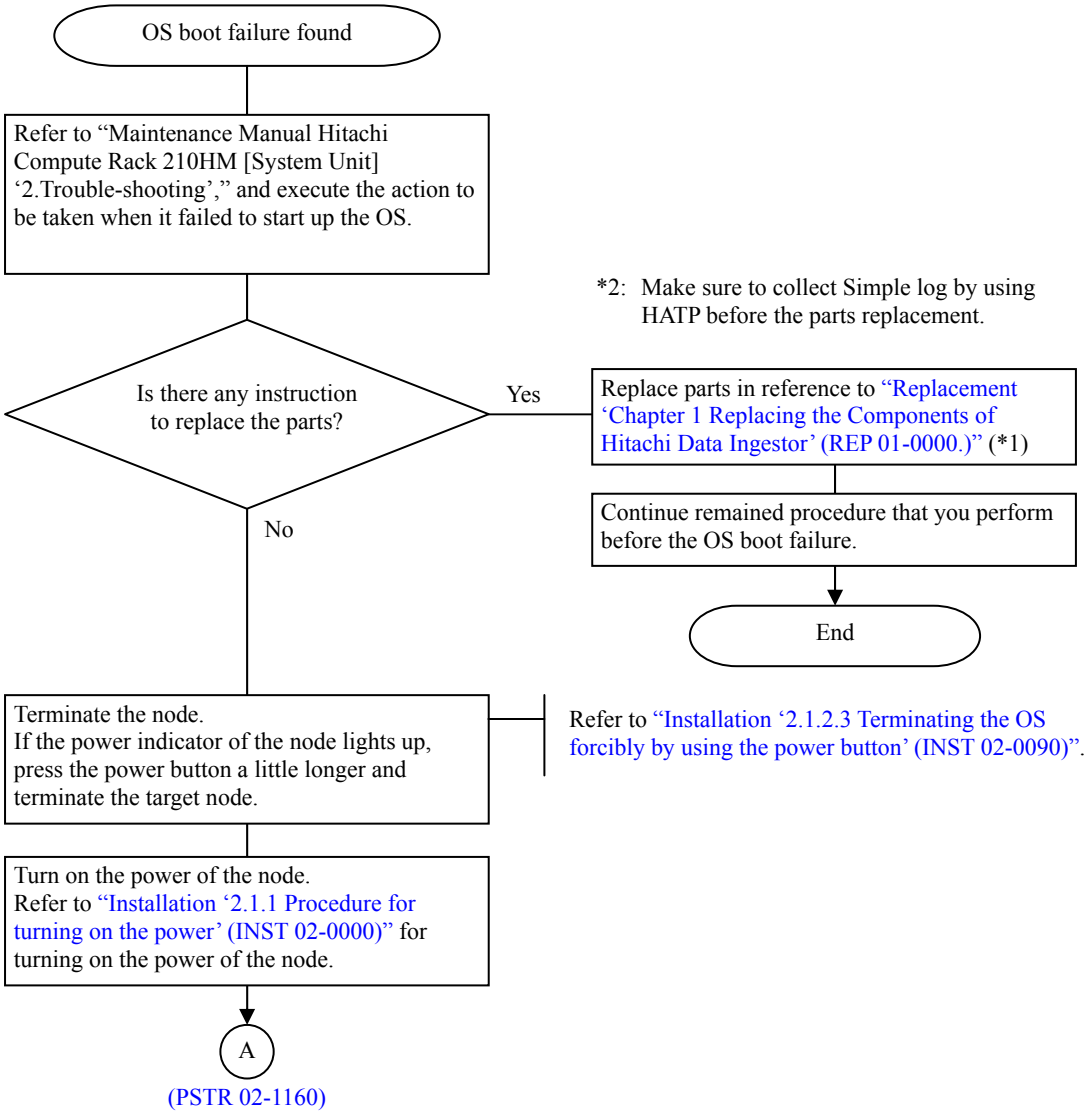

Figure C.2.4-1 Flow of Diagnosis for OS boot failure (1/5)

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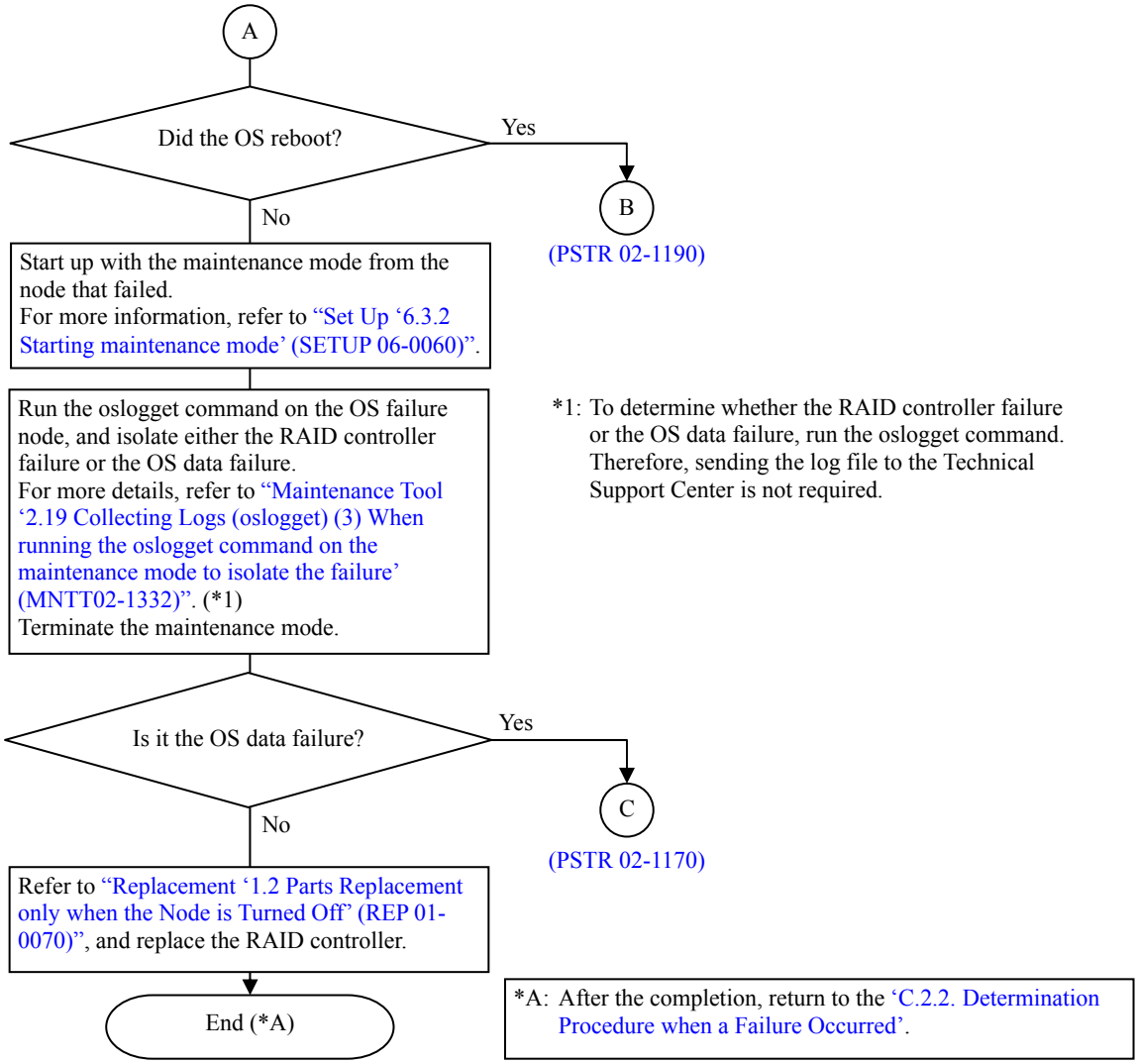

Figure C.2.4-1 Flow of Diagnosis for OS boot failure (2/5)

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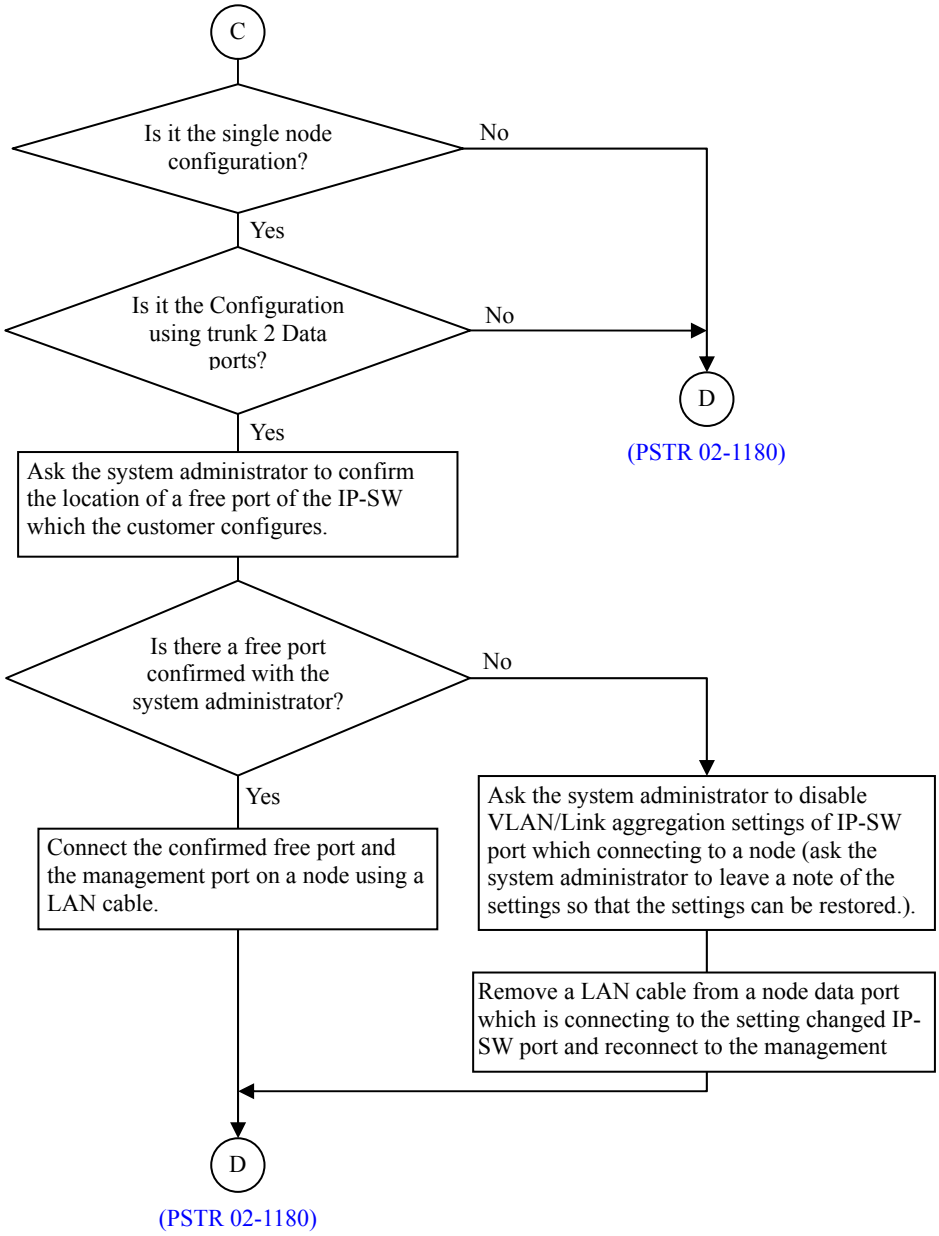

Figure C.2.4-1 Flow of Diagnosis for OS boot failure (3/5)

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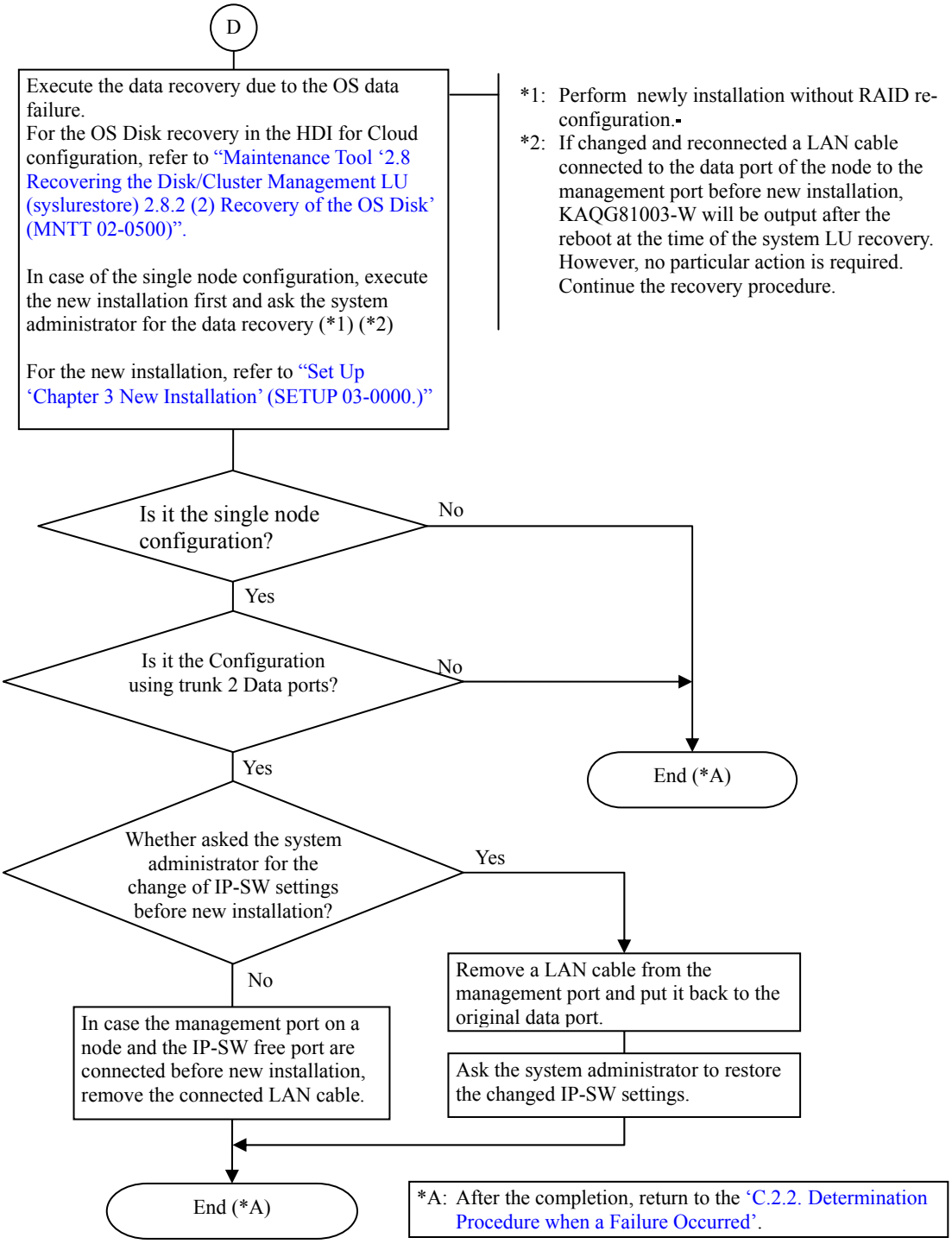

Figure C.2.4-1 Flow of Diagnosis for OS boot failure (4/5)

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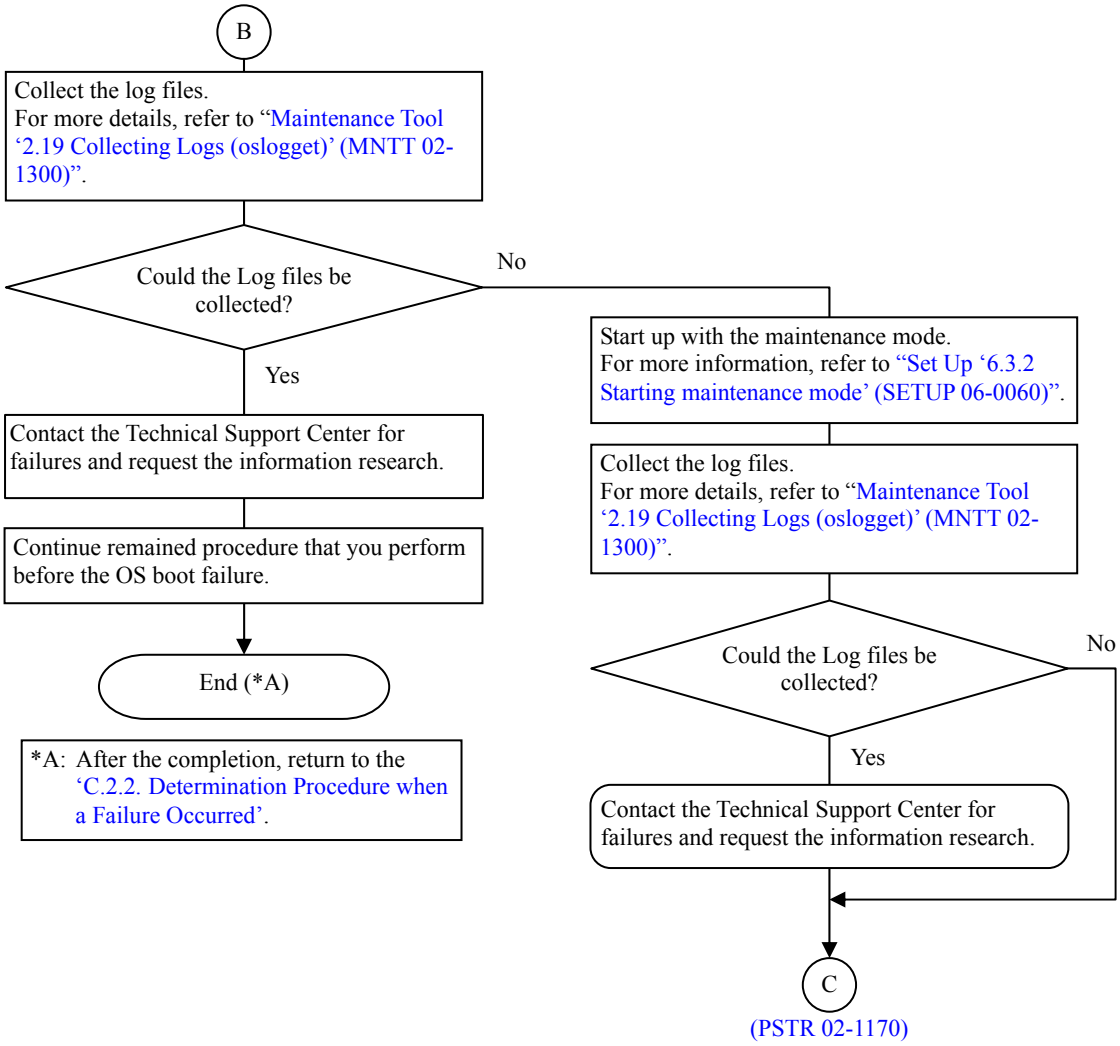

Figure C.2.4-1 Flow of Diagnosis for OS boot failure (5/5)

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C.3 Messages

This chapter describes messages.

C.3.1 SIM Messages

SIM messages detected by HDI and the recovery methods are described below.

Table C.3.1-1 Message IDs (70000s)

Message ID	Message text	Description	Recovery method	Reference Page
KAQG70000-E	Failover started, Node-*<node-number>* [(virtual server ID = *<virtual-server-ID>*)]	This message reports that a failover started at *<#node>*. When the target failover is Virtual Server, *<virtual-server-ID>* is output in brackets "( )".	—	—
KAQG70001-E	Failover ended, Node-*<node-number>* [(virtual server ID = *<virtual-server-ID>*)]	This message reports that a failover was completed at *<#node>*. When the target failover is Virtual Server, *<virtual-server-ID>* is output in brackets "( )".	—	—
KAQG72001-E	Failover ended(Move failed),Node-*<node-number>* [(virtual server ID = *<virtual-server-ID>*)]	This message reports that a failover failed. When the target failover is Virtual Server, *<virtual-server-ID>* is output in brackets "( )".	Perform the recovery procedure according to Troubleshooting "Chapter 1 Method of Local Initial Motion according to Maintenance Request".	"Troubleshooting 'Chapter 1 Method of Local Initial Measures According to Maintenance Request' (TRBL 01-0000)"
KAQG72011-E	Synchronization of the cluster information might become invalid.	This message reports that a failure occurred in the internal database of the cluster.	Perform the recovery procedure according to Troubleshooting "Chapter 1 Method of Local Initial Motion according to Maintenance Request".	"Troubleshooting 'Chapter 1 Method of Local Initial Measures According to Maintenance Request' (TRBL 01-0000)"

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Message ID	Message text	Description	Recovery method		Reference Page
KAQG72012-W	Communication via the main heartbeat cable was interrupted.	A failure occurred in the main heartbeat cable.	Follow the determination flowchart of Troubleshooting ‘C.2.3.6 Determination of network failure (1) In the case of the KAQG72012-W’.		‘C.2.3.6 Determination of network failure (1) In the case of the KAQG72012-W’
KAQG72013-W	Communication via the sub heartbeat cable was interrupted.	A failure occurred in the sub heartbeat cable.	①	Check if the KAQG72012-W message was reported before or after the KAQG72013-W message. • If it was reported, two heartbeat cables are disconnected (Link down). Proceed to step②. • If it was not reported, proceed to step③	—
			②	Check if the failover completion message (KAQK70001-E) was reported within 60 seconds before or after this message. • If it is reported, refer to ‘C.2.3.4 Determining the node failure when failover occurred,’ and then execute the failure determination. • If it is not confirmed, refer to ‘C.2.3.2 Determination of management network failure’ and perform the recovery procedure.	‘C.2.3.4 Determining the node failure when failover occurred’ ‘C.2.3.2 Determination of management network failure’
			③	A failure occurred on the way of connecting maintenance LAN port of the node. Follow the procedure of ‘C.2.2 Determination Procedure when a Failure Occurred’.	‘C.2.2 Determination Procedure when a Failure Occurred’
KAQG72014-I	Communication via the main heartbeat cable was restored.	The main heartbeat cable has recovered.	—		—
KAQG72015-I	Communication via the sub heartbeat cable was restored.	The sub heartbeat cable has recovered.	—		—

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Message ID	Message text	Description	Recovery method	Reference Page
KAQG72026-E	The resource group on the other node will be forcibly failed over to clear the DISABLE state of the cluster.	Automatic forced failover occurred.	A failure occurs on the power source or on the heartbeat channel and the reset channel connecting the both nodes. Go to 'C.2.2 Determination Procedure when a Failure Occurred', and then execute the troubleshooting.	'C.2.2 Determination Procedure when a Failure Occurred'
KAQG72027-E	The OS will restart to clear the DISABLE state of the cluster.	Automatic forced failover occurred on the other side node.	① Check if the KAQG72026-E message was reported for the other side node at the same period of time. •If it is reported, a failure has been occurred on the routes of heartbeat and reset that are connecting both nodes. Refer to "Message IDs (KAQG72026-E)". •If it was not reported, or the other side node is stopped, proceed to step②.	Message IDs (KAQG72026-E)
			② It might be interrupted the process of forced failover due to another failure. Refer to Troubleshooting "Chapter 6 Acquiring Failure Information", and get the troubleshooting information. After that, contact to the technical support center.	"Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)"
KAQG72028-W	The forced failover state will be cleared because the problem on the other node has been resolved.	The state of automatic forced failover is recovered.	—	—
KAQG72029-E	To clear the forced failover state, an attempt was made to restart the OS of the other node, but the attempt failed.	Resetting of the other side node failed at the time of recovering the state of forced failover.	The heartbeat channel that connected both nodes of a cluster where was in the state of automatic forced failover is recovered, but the reset process for the other side node has failed because there was still a failure on the reset channel. Go to 'C.2.2 Determination Procedure when a Failure Occurred', and then execute the troubleshooting.	'C.2.2 Determination Procedure when a Failure Occurred'
KAQG72030-E	To clear the forced failover state, an attempt was made to release access protection on one more LUs, but the attempt failed.	Releasing of the LU access protection failed at the time of recovering the state of forced failover.	The heartbeat channel that connected both nodes of a cluster in the state of automatic forced failover is recovered, but the release of LU access protection has failed. Refer to Troubleshooting "5.3 Measures when Releasing the LU Access Protection Failed", and execute the recovery procedure.	"Troubleshooting '5.3 Measures when Releasing the LU Access Protection Failed' (TRBL 05-0530)"

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Table C.3.1-2 Message IDs (80000s)

Message ID	Message text	Description	Recovery method	Reference Page
KAQG81003-W	Trunking driver: One or more subdevices are down. *<master-device-name>:<subdevice-name>,<subdevice-name>…*	Links of the reported driver are combined (i.e. the number of links increases or decreases).	Follow the determination flowchart of Troubleshooting 'C.2.3.6 Determination of network failure (2) In the case of the KAQG81003-W'.	'C.2.3.6 Determination of network failure (2) In the case of the KAQG81003-W'
KAQG81004-I	Trunking driver: The subdevices that were down have been recovered. *<master-device-name>*: *<subdevice-name>*, *<subdevice-name>…*	Links of the reported driver are combined (i.e. down links have recovered).	—	—
KAQG81101-W	Trunking driver: The master device *<link-combined-device-name>* is down because all the sub-device were down.	Failures occurred in all ports of the combined links.	In the case of the cluster configuration, check if the KAQG70001-E message was reported within 60 seconds before or after this message. • If it is confirmed, follow the determination flowchart of Troubleshooting 'C.2.3.6 Determination of network failure (4) In the case of the KAQK39504-E'. • If it is not confirmed, there is a possibility of a port failure on the IP Switch connecting with the User LAN. Request the system administrator to check the failed port and recover it. After the IP Switch recovery, refer to the failure recovery procedure of Troubleshooting "Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and confirm that all ports of the relevant node are in the normal status. In the case of the single node configuration, follow the determination flowchart of Troubleshooting 'C.2.3.6 Determination of network failure (4) In the case of the KAQK39504-E'.	'C.2.3.6 Determination of network failure (4) In the case of the KAQK39504-E' "Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
KAQK81102-I	Trunking driver: The sub-devices that were down have recovered, and the master device *<link-combined-device>* has recovered.	All ports of the combined links have recovered.	—	—

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Table C.3.1-3 Message IDs (30000s)

Message ID	Message text	Description	Recovery method		Reference Page
KAQK30800-I	Migration terminated. (Policy name: <*policy name*>, Task id: <*task-id*>, Task status: <*task-status*>, Lastexec start time: <*lastexec-start-time*>, Lastexec end time: <*lastexec-end-time*>, Succeeded files: <*succeeded-files*>, Target files: <*target-files*>, Failed files: <*failed-files*>, Post-command result: <*post-command-result*>)	The termination of the migration job occurred.	—		—
KAQK30801-E	MIACAT detected a failure (MAR=<*MAR*><*MAR*> RC=<*RC*>)	A hardware failure occurred in the node and RC is detected.	①	Execute ccp command and acquire the RC information.	"Maintenance Tool '2.61 RC Information Acquisition (ccp)' (MNTT 02-3270)"
			②	Refer to "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]," and determine the failure part from the RC and the continuous log.	"Maintenance Manual Hitachi Compute Rack 210HM [System Unit]"
			③	Replace the part that determined as failed.	"Replacement 'Chapter 1 Replacing the Components of Hitachi Data Ingestor'(REP 01-0000)"
KAQK36504-W	NIC: Link down detected (<*interface-name*>)	NIC became link-down.	Follow the determination flowchart of Troubleshooting 'C.2.3.6 Determination of network failure (3) In the case of the KAQK36504-W'.		'C.2.3.6 Determination of network failure (3) In the case of the KAQK36504-W'

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Message ID	Message text	Description	Recovery method	Reference Page
KAQK36700-E	An FC path error has occurred. (number of LUs for which errors occurred = *<number of LUs for which errors occurred>*)	FC path failure occurred. The number of LUs that the failures are detected is displayed.	Follow the determination flowchart of 'C.2.2 Determination Procedure when a Failure Occurred' and identify the failure location on the FC path.	'C.2.2 Determination Procedure when a Failure Occurred'
KAQK36701-E	Errors have occurred on all the FC paths. (number, subsequent processing of LUs for which errors occurred = *<number, subsequent processing of LUs for which errors occurred>*)	Failures occurred in all paths to the LU. The number of LUs from which failures are detected is displayed. In the case "reboot" is displayed as the subsequent processing, the OS has been restarted once after the failure. In the case "continue" or "failure" is displayed as the subsequent processing, the OS has been running (not restarted). In the case of "disconnect", the OS has been restarted once after the failure usually, but depend on the settings, the OS may have been running without restarting.	Check if the KAQK39527-E message was reported after this message. • If it is confirmed, refer to "Message IDs (KAQK39527-E)". • If it is not confirmed, Confirm that the KAQK36700-E message was reported before this message. Perform the same procedure as for "Message IDs (KAQK36700-E)".	'Message IDs (KAQK39527-E)' Message IDs (KAQK36700-E)
KAQK36703-E	An attempt to allocate memory failed.	Failed to allocate memory.	Check if the KAQK36705-E message was reported after this message. • If it is confirmed, refer to "Message IDs (KAQK36705-E)". • If it is not confirmed, follow the determination flowchart of 'C.2.2 Determination Procedure when a Failure Occurred' to identify the failure location on the FC path.	Message IDs (KAQK36705-E) 'C.2.2 Determination Procedure when a Failure Occurred'
KAQK36704-E	An attempt to attach the HDLM driver (the filter component) has failed. Number of failed paths = <number>	Unsupported disk array is detected.	Request the system administrator to check the zoning setting of FC-SW.	—
KAQK36705-E	The system retried to allocate memory but the retries failed.	Memory allocation was attempted in succession but failed.	FC path failure. Follow the determination flowchart of 'C.2.2 Determination Procedure when a Failure Occurred' to identify the failure location on the FC path.	'C.2.2 Determination Procedure when a Failure Occurred'

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Message ID	Message text	Description	Recovery method	Reference Page
KAQK37508-W	BMC network communication failure detected	Communication is lost between the management port (in the BMC direct connection configuration, Reset port) and the remote node's BMC port.	Refer to Troubleshooting 'C.2.2 Determination Procedure when a Failure Occurred' to check if this is a management LAN failure.	'C.2.2 Determination Procedure when a Failure Occurred'
KAQK37509-I	BMC network communication failure recovered	Communication is reestablished between the management port (in the BMC direct connection configuration, Reset port) and the remote node's BMC port.	—	—
KAQK37510-W	Management network communication failure detected	Communication is lost between the local management port and the remote node's management port.	Refer to Troubleshooting 'C.2.2 Determination Procedure when a Failure Occurred' to check if this is a management LAN failure.	'C.2.2 Determination Procedure when a Failure Occurred'
KAQK37511-I	Management network communication failure recovered	Communication is reestablished between the local management port and the remote node's management port.	—	—
KAQK37512-E	The number of internal RAID device media errors has exceeded the threshold. (internal_disk_<*number*>)	A media error in the built-in HDD is detected.	Replace the built-in HDD that is subject to be replaced for the prevention.	"Replacement '1.3 Replacing the Internal Hard Disk Drive'(REP 01-0110)"
KAQK37513-I	The number of internal RAID device media errors has been cleared. (internal_disk<*number*>)	A media error in the built-in HDD is recovered.	—	—
KAQK37514-E	The number of internal RAID device S.M.A.R.T. warnings has exceeded the threshold. (internal_disk_<*number*>)	The built-in HDD detects S.M.A.R.T. warning.	Replace the built-in HDD that is subject to be replaced for the prevention.	"Replacement '1.3 Replacing the Internal Hard Disk Drive'(REP 01-0110)"
KAQK37515-I	The number of internal RAID device S.M.A.R.T. warnings has been cleared. (internal_disk_<*number*>)	Recovered the S.M.A.R.T. warning that is detected by the built-in HDD.	—	—

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Message ID	Message text	Description	Recovery method	Reference Page
KAQK37516-I	Patrol Read detected information.(Details: time =<*time*>, code = <*code*>, content = <*content*>, count = <*count*>)	Some events about internal HDD were detected. (Number of count is displayed only when the multiple events occurred.)	—	—
KAQK37518-I	Patrol Read detected an error.(Details: time =<*time*>, code = <*code*>, content = <*content*>, count = <*count*>)	Critical Error might be occur at internal HDD. (Number of count is displayed only when the multiple errors occurred.)	The slot number of failed embedded HDD is displayed as "sX (X is positive integer)" in "content" of the message. Replace the embedded HDD connected to that slot number.	"Replacement '1.3 Replacing the Internal Hard Disk Drive'(REP 01-0110)"
KAQK37521-I	Communication temporarily went down between the management port and the BMC port on the other node.	The communication between the management port (in the BMC direct connection configuration, Reset port) and the BMC port on the other side node lost temporarily.	Check if KAQK37508-W or KAQK37522-I exists after this SIM. If the message exists, follow the instruction described in that message. If the message does not exist, no measurement is required because the communication was lost temporarily but it recovers at present.	'Message IDs (KAQK37508-W)' Message IDs (KAQK37522-I))
KAQK37522-I	Intermittent failures have been detected <*X*> times between the management port and the BMC port on the other node.	The intermittent failure between the management port (in the BMC direct connection configuration, Reset port) and the BMC port in the other side node is detected x times.	Check if KAQK37508-W exists after this SIM. If the message exists, follow the instruction described in that message. If the message does not exist, no measurement is required because the communication was lost temporarily but it recovers at present. However, If this message shows frequency, the cable might not be connected completely. Therefore, check the connection between the cable on the maintenance port and the cable of the BMC port on the other side node.	'Message IDs (KAQK37508-W)'
KAQK37523-I	Information regarding the internal RAID battery was detected. (time = <*time*>, code =0x000c, content = <*content*>)	An event about internal RAID battery was detected.	—	—
KAQK37524-W	An internal RAID battery failure was detected. (time = <*time*>, code = 0x000a, content = <*content*>)	A failure event about internal RAID battery was detected.	There is a possibility that a part of data has been lost. Execute the OS initial installation (with RAID reconfiguration), and request the system administrator to execute the recovery operation. Refer to 'C.1.2 When Detected by SNMP Trap' for more details.	'C.1.2 When Detected by SNMP Trap'
KAQK37526-I	Consistency Check detected information. (time = <*time*>, code = <*code*>, content = <*content*>, count = <*count*>)	Consistency check detected information ("count" is displayed only when information is detected more than once.)	—	—
KAQK37528-E	Consistency Check detected an error.(time = <*time*>, code = <*code*>, content = <*content*>, count = <*count*>)	Consistency check detected an error ("count" is displayed only when errors are detected more than once.)	Check that the status of "Internal HDD Information" is "OK" by executing hwstatus command. After checking, collect the failure information and contact the developer."	'B.3.1 Displaying the Hardware Status (hwstatus)' "Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)"

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Message ID	Message text	Description	Recovery method	Reference Page
KAQK39500-E	OS error Detail= 00 00 00 01 ,Level =00 , Type=02	The file system necessary for booting is blocked or failed in mounting.	Follow the determination flowchart of ‘C.2.2 Determination Procedure when a Failure Occurred’.	‘C.2.2 Determination Procedure when a Failure Occurred’
	OS error Detail= 00 00 00 02 ,Level =00 , Type=02	A user file system is blocked.	Follow the determination flowchart of ‘C.2.2 Determination Procedure when a Failure Occurred’.	‘C.2.2 Determination Procedure when a Failure Occurred’
	OS error Detail= 00 00 00 02 ,Level =00 , Type=0c	The logical volume entered a state where it cannot be accessed. (The file system or differential-data snapshots can no longer be used.)	Ask the system administrator to confirm whether KAQG51003-E message has been output at the system message. If the message has been output, confirm to system administrator that an appropriate action about KAQG51003-E has been finished. And acquire the trouble information and send it to the Technical Support Center. If the message has not been output, acquires the trouble information and send it to the Technical Support Center with the comment that “There has not been output KAQG51003-E”.	“Troubleshooting ‘Chapter 6 Acquiring Failure Information’ (TRBL 06-0000)”
	OS error Detail= 00 00 00 03 ,Level =00 , Type=02	A cluster management LU file system is blocked.	Follow the determination flowchart of Troubleshooting “9.1.3 Recovery Procedure for Software Failure”.	“Troubleshooting ‘9.1.3 Recovery Procedure for Software Failure’ (TRBL 09-0050)”
	OS error Detail= 00 00 00 06 ,Level =00 , Type=02	A Virtual Server system LU is blocked.	Follow the determination flowchart of Troubleshooting “9.1.3 Recovery Procedure for Software Failure”.	“Troubleshooting ‘9.1.3 Recovery Procedure for Software Failure’ (TRBL 09-0050)”
	OS error Detail= 00 00 03 00 ,Level =00 , Type=0D	Breakdown of the heartbeat between the primary and the secondary is detected.	① Perform “clstatus” on the node that have this SIM message, and check the cluster status.	“Maintenance Tool ‘2.2 Displaying the Cluster Status (clstatus)’ (MNTT 02-0040)”
			② ‘C.2.2 Determination Procedure when a Failure Occurred’	‘C.2.2 Determination Procedure when a Failure Occurred’
	OS error Detail= 00 00 03 01 ,Level =00 , Type=0D	Breakdown of the heartbeats between the primary and the secondary is detected, and resetting route on the management LAN is detected.	To confirm the failure on the management LAN, execute the determination procedure from the ‘C.2.2 Determination Procedure when a Failure Occurred’.	‘C.2.2 Determination Procedure when a Failure Occurred’
	OS error Detail= 00 00 04 00 ,Level =00 , Type=0D	The reset ping-pong prevention was operated.	Follow the determination flowchart of ‘C.2.2 Determination Procedure when a Failure Occurred’.	‘C.2.2 Determination Procedure when a Failure Occurred’
	OS error Detail= 00 01 00 02 ,Level =00 , Type=0A	The target file system to be stored is initialized before creating dump file.	Node is rebooted because of occurrence of an error, and an error is detected while collecting Dump. Collect the information of troubles, and report it to the Technical Support Center after executing troubleshooting with referring to the chapter of troubleshooting.	“Troubleshooting ‘Chapter 6 Acquiring Failure Information’ (TRBL 06-0000)”
	OS error Detail= 00 02 00 02 ,Level =00 , Type=0A	Failed to mount the target file system to be stored at the time of dump collecting.	An error detected in the dump area while starting the node. Execute troubleshooting with referring to ‘C.2.2 Determination Procedure when a Failure Occurred’.	‘C.2.2 Determination Procedure when a Failure Occurred’

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Message ID	Message text	Description	Recovery method		Reference Page
(Continued) KAQK39500-E	OS error Detail= 05 00 00 00 ,Level =00 , Type=03	A panic failure occurred on the node that failed.	①	• If it is after nncreset command execution of the "Maintenance Tool '2.30 Resetting the OS of the Node (nncreset)'" performed by the maintenance personnel, proceed to step②. • If it is not a result of the command that is executed by the maintenance personnel, proceed to step③.	"Maintenance Tool '2.30 Resetting the OS of the Node (nncreset)' (MNTT 02-1840)"
			②	It indicates that the nncreset command successfully complete and the dump can be obtained normally. Proceed to the next step such as the collecting dump.	—
			③	A panic failure occurred on the node that failed, and the dump can be obtained normally after the failure. Refer to 'C.2.3.4 Determining the node failure when failover occurred,' and then execute the failure determination.	'C.2.3.4 Determining the node failure when failover occurred'
	OS error Detail= 05 00 00 01 ,Level =00 , Type=03	Memory image copying is complete successfully.	①	• If it is manual dump collection by the system administrator or the maintenance personnel (dump collection by the NMI button or the nncreset command of "Maintenance Tool '2.30 Resetting the OS of the Node (nncreset)'", proceed to step②. • In other cases than the above, proceed to step③.	"Maintenance Tool '2.30 Resetting the OS of the Node (nncreset)' (MNTT 02-1840)"
			②	After a while, if "KAQK39528-I Processing to convert dump files ended." is displayed, as the dump file conversion is successful, execute the subsequent operation such as downloading dump. If the other SIM than the above is displayed after a while, the dump file creation failed. Collect the failure information, and contact the developer.	"Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)"
			③	A panic failure occurred on the failed node, and then the dump is acquired normally. Refer to 'C.2.3.4 Determining the node failure when failover occurred', and determine the failure.	'C.2.3.4 Determining the node failure when failover occurred'
	OS error Detail= 06 00 00 00 ,Level =00 , Type=03	Dump conversion timeout.	The node is rebooted due to a software failure. Collect the failure information and contact the developer.		"Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)"
	OS error Detail= 06 00 01 00 ,Level =00 , Type=03	Dump file conversion failed.	The node is rebooted due to a software failure. Collect the failure information and contact the developer.		"Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)"
	OS error Detail= 06 00 02 00 ,Level =00 , Type=03	Forced conversion of the dump file failed.	The node is rebooted due to a software failure. Collect the failure information and contact the developer.		"Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)"
	OS error Detail= 06 00 03 00 ,Level =00 , Type=03	Memory image copying failed.	The node is rebooted due to a software failure. Collect the failure information and contact the developer.		"Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)"
	OS error Detail= 06 01 01 00 ,Level =00 , Type=0A	Failed to register the function of dump file creation.	Failed to register the dump file creation function which is executed at the time of boot the node. Collect the failure information and contact the developer.		"Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)"

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Message ID	Message text	Description	Recovery method	Reference Page
KAQK39501-E	Fatal failure detected. Shutting down.	An emergency shutdown occurred.	—	—
KAQK39502-I	OS is ready	This message is reported just before completion of the OS boot.	—	—
KAQK39503-I	OS is shutting down.	This message reports that shutdown of either system or both systems have started.	—	—
KAQK39504-E	Link down in Front-end LAN	The data LAN or the maintenance LAN is link-down.	Follow the determination flowchart of Troubleshooting 'C.2.3.6 Determination of network failure (4) In the case of the KAQK39504-E'.	'C.2.3.6 Determination of network failure (4) In the case of the KAQK39504-E'
KAQK39505-E	OS error[cluster] Detail=00 01 00 00	Mounting the cluster management LU failed (CLU_partition failure).	Refer to the failure recovery procedure of Troubleshooting "Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	OS error[cluster] Detail=00 02 00 00	Pre-processing of NFS failed.	Refer to the failure recovery procedure of Troubleshooting "Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	OS error[cluster] Detail=00 03 00 00	Mounting the file system failed.	Ask the system administrator for the enabling or disabling of the local data encryption and the HCP payload encryption. If the local data encryption is enabled, ask the system administrator to confirm one of the system messages KAQM05256-E, KAQM05258-E to KAQM05264-E, KAQM05323-E, KAQM05325-W has not been output. In case the one of the messages has been output, ask the system administrator to take an appropriate action. If no message has been output, or the local data encryption and HCP payload encryption are disabled, refer to the failure recovery procedure of Troubleshooting "Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	OS error[cluster] Detail= 00 04 00 00	Starting the NFS sharing failed.	Refer to the failure recovery procedure of Troubleshooting "Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"

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Message ID	Message text	Description	Recovery method		Reference Page
(Continued) KAQK39505-E	OS error[cluster] Detail=00 05 00 00	Bringing the virtual IP up failed.	①	Check if the KAQK39504-E message was reported within 60 seconds before or after this message. • If it is confirmed, proceed to step②. • If it is not confirmed, proceed to step③.	'Message IDs (KAQK39504-E)'
			②	Perform the maintenance procedure described in "Message IDs (KAQK39504-E)".	'Message IDs (KAQK39504-E)'
			③	Refer to the failure recovery procedure of Troubleshooting "Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	OS error[cluster] Detail=00 06 00 00	Starting the CIFS service failed.	Refer to the failure recovery procedure of Troubleshooting "Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.		"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	OS error[cluster] Detail=00 08 00 00	Startup processing of the resource group failed.	Refer to the failure recovery procedure of Troubleshooting "Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.		"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	OS error[cluster] Detail=00 0A 00 00	File snapshot or file version restore function failure (Startup processing of the resource group failed.)	Refer to the failure recovery procedure of Troubleshooting "Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.		"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	OS error[cluster] Detail= 00 0B 00 00	Start processing of Virtual Server failed.	Ask the system administrator for the enabling or disabling of the local data encryption and the HCP payload encryption. If the local data encryption is enabled, ask the system administrator to confirm one of the system messages KAQM05256-E, KAQM05258-E to KAQM05264-E, KAQM05323-E, KAQM05325-W has not been output. In case the one of the messages has been output, ask the system administrator to take an appropriate action. If no message has been output, or the local data encryption and HCP payload encryption are disabled, refer to the failure recovery procedure of Troubleshooting "Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.		"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"

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Message ID	Message text	Description	Recovery method	Reference Page
(Continued) KAQK39505-E	OS error[cluster] Detail=01 01 00 00	Un mounting the cluster management LU failed (CLU_partition failure).	Refer to the failure recovery procedure of Troubleshooting “Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure” and recover the failure.	“Troubleshooting ‘Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure’ (TRBL 09-0000)”
	OS error[cluster] Detail=01 02 00 00	Post-processing of NFS failed.	Refer to the failure recovery procedure of Troubleshooting “Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure” and recover the failure.	“Troubleshooting ‘Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure’ (TRBL 09-0000)”
	OS error[cluster] Detail=01 03 00 00	Unmounting the file system failed.	Refer to the failure recovery procedure of Troubleshooting “Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure” and recover the failure.	“Troubleshooting ‘Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure’ (TRBL 09-0000)”
	OS error[cluster] Detail=01 04 00 00	Stopping the NFS sharing failed.	Refer to the failure recovery procedure of Troubleshooting “Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure” and recover the failure.	“Troubleshooting ‘Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure’ (TRBL 09-0000)”
	OS error[cluster] Detail=01 05 00 00	Bringing the virtual IP down failed.	① Check if the KAQK39504-E message was reported within 60 seconds before or after this message. • If it is confirmed, proceed to step②. • If it is not confirmed, proceed to step③.	‘Message IDs (KAQK39504-E)’
			② Perform the maintenance procedure described in “Message IDs (KAQK39504-E)”.	‘Message IDs (KAQK39504-E)’
			③ Refer to the failure recovery procedure of Troubleshooting “Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure” and recover the failure.	“Troubleshooting ‘Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure’ (TRBL 09-0000)”

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(Continued) KAQK39505-E	OS error[cluster] Detail=01 06 00 00	Stopping the CIFS service failed.	Refer to the failure recovery procedure of Troubleshooting “Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure” and recover the failure.	“Troubleshooting ‘Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure’ (TRBL 09-0000)”
	OS error[cluster] Detail=01 08 00 00	Stop processing of the resource group failed.	Refer to the failure recovery procedure of Troubleshooting “Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure” and recover the failure.	“Troubleshooting ‘Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure’ (TRBL 09-0000)”
	OS error[cluster] Detail=01 0A 00 00	File snapshot or file version restore function failure (Stop processing of the resource group failed.)	Refer to the failure recovery procedure of Troubleshooting “Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure” and recover the failure.	“Troubleshooting ‘Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure’ (TRBL 09-0000)”
	OS error[cluster] Detail= 01 0B 00 00	Stopping Virtual Server failed.	Refer to the failure recovery procedure of Troubleshooting “Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure” and recover the failure.	“Troubleshooting ‘Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure’ (TRBL 09-0000)”

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Message ID	Message text	Description	Recovery method	Reference Page
KAQK39506-I	A failure occurred. Please follow the proper recovery procedure. Detail=10 03 00 00	All file systems were blocked due to D-vol overflow (when the script was started).	Send the content of this message to the system administrator.	—
	A failure occurred. Please follow the proper recovery procedure. Detail=10 04 00 00	All NFSs were blocked due to D-vol overflow (when the script was started).	Send the content of this message to the system administrator.	—
KAQK39507-E	Reset to the other node in the cluster was requested (result:<*reset requested result*>, cause:<*reset cause*>, os status:<*OS status*>).	Resetting for the other side is issued.	If the content of the result is "failure", resetting the other side node is not successful. Determine the failure with 'C.2.2 Determination Procedure when a Failure Occurred'. If the content of the result is other than above, it is normal processing and not required any troubleshooting.	'C.2.2 Determination Procedure when a Failure Occurred'
KAQK39524-E	Peer os status could not be acquired.	Acquisition of status of the other side node failed.	① Check if the KAQK37508-W message was reported before or after reporting the KAQK39508-E message. • If it is reported, refer to "Message IDs (KAQK37508-W)". • If it is not reported, proceed to step②.	'Message IDs (KAQK37508-W)'
			② A failure is in the setting of BMC. Refer to "Maintenance tool 2.18 Setting BMC LAN Information (bmcctl) (3) Setting BMC account", and then set the BMC account.	"Maintenance Tool '2.18 Setting BMC LAN Information (bmcctl)' (MNTT 02-1210)"
KAQK39525-I	Peer os status could be acquired.	Recovered to the state to get the other side node status.	—	—
KAQK39526-I	The blockage of the file system (file-system-name) has been released.	The blockage of the file system (file-system name) has been released.	—	—
KAQK39527-E	A file system (file system name = <*file system name*>, device = <*device number*>) is blocked because there is no unused capacity in the Pool	The user file system has been in blockage because of the DP pool exhaustion .	Ask system administrator to recover the DP pool exhaustion.	—
KAQK39528-I	Processing to convert dump files ended.	Dump file conversion ended normally.	—	—
KAQK39529-E	Dump file conversion processing for the virtual server ended successfully. (virtual server ID = <*virtual server ID*>)	Dump file conversion of the displayed Virtual Server ID ended normally	After a while, if the message of "KAQK39539-I Conversion processing ended successfully for all the dump files." is displayed on the window, the dump file conversion for all the Virtual Servers is successfully complete. Therefore, proceed to the next step such as the dump collection.	—

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Message ID	Message text	Description	Recovery method	Reference Page
KAQK39530-E	Acquisition of the dump file header information for the virtual server failed. (virtual server ID = <*virtual server ID*>)	Failed to get the dump file header information of the displayed Virtual Server ID.	Request the system administrator to reboot the relevant Virtual Server of the ID that is displayed on the window. When the system administrator is not available to operate it, maintenance personnel should execute this process by using vnasrestart command. If the same SIM message is displayed after the reboot, collect the failure information and contact the Technical Support Center.	"Maintenance Tool '2.77 Restart of Virtual Server (vnasrestart)' (MNTT 02-4090) "Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)"
KAQK39531-E	Dump file creation processing failed because the number of virtual server dump files reached the limit. (virtual server ID = <*virtual server ID*>)	The dump file of the displayed Virtual Server ID could not be created because the number of dump files has reached 5 files that was the upper limit of file storage.	Collect the failure information, and contact the Technical Support Center. The dump file of the displayed Virtual Server ID is not created even after some existing dump files are deleted. If the dump file of the displayed Virtual Server ID is necessary, refer to Troubleshooting "6.2.1.2 Collecting dump files manually", and then collect the dump file.	"Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)" "Troubleshooting '6.2.1.2 Collecting dump files manually' (TRBL 06-0030)"
KAQK39532-E	Dump file creation processing failed. (virtual server ID = <*virtual server ID*>)	Failed to create the dump file of the displayed Virtual Server ID because the capacity of the dump file storage area was insufficient.	Collect the failure information, and contact the Technical Support Center. The dump file of the displayed Virtual Server ID is not created even after some existing dump files are deleted. If the dump file of the displayed Virtual Server ID is necessary, refer to Troubleshooting "6.2.1.2 Collecting dump files manually", and then collect the dump file.	"Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)" "Troubleshooting '6.2.1.2 Collecting dump files manually' (TRBL 06-0030)"
KAQK39533-E	Dump file conversion processing for the virtual server was stopped.	Dump file conversion processing was inhibited because the capacity of dump file storage area was insufficient.	Download all the stored dump files and delete them all. After that, the converting process of the unconverted dump files is executed automatically.	"Maintenance Tool '2.21 Procedure for Collecting Dump Files' (MNTT 02-1400)
KAQK39534-E	Dump file forced conversion processing for the virtual server ended successfully. (virtual server ID = <*virtual server ID*>)	Although the dump file conversion processing of the displayed Virtual Server ID is complete, a problem might have occurred on a part of converting process.	Collect the failure information, and then contact the technical support center.	"Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)"
KAQK39535-E	Dump file conversion processing for the virtual server failed.(virtual server ID = <*virtual server ID*>)	Failed the convert the dump file of displayed Virtual Server ID.	Collect the failure information, and then contact the technical support center.	"Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)"
KAQK39536-E	An error occurred in dump file creation processing for the virtual server.	Failed to create the dump file of displayed Virtual Server ID.	Collect the failure information, and then contact the technical support center.	"Troubleshooting 'Chapter 6 Acquiring Failure Information' (TRBL 06-0000)"

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Message ID	Message text	Description	Recovery method	Reference Page
KAQK39538-E	An OS error was detected on the virtual server.(virtual server ID = <virtual server ID>)	The virtual Server of the displayed Virtual Server ID is blocked.	Execute the troubleshooting from the 'C.2.2 Determination Procedure when a Failure Occurred'.	'C.2.2 Determination Procedure when a Failure Occurred'
KAQK39539-I	Conversion processing ended successfully for all the dump files.	Converting all the unconverted dump files is complete.	—	—
KAQK39540-I	The virtual server was reset. (virtual server ID=<virtual server ID>)	The displayed Virtual Server ID was reset.	—	—
KAQK39601-E	Single Node error Detail=00 00 00 10 Level=00 Type=04	Mounting of file system failed.	Ask the system administrator for the enabling or disabling of the local data encryption and the HCP payload encryption. If the local data encryption is enabled, ask the system administrator to confirm one of the system messages KAQM05256-E, KAQM05258-E to KAQM05264-E, KAQM05323-E, KAQM05325-W has not been output. In case the one of the messages has been output, ask the system administrator to take an appropriate action. If no message has been output, or the local data encryption and HCP payload encryption are disabled, refer to the failure recovery procedure of Troubleshooting "Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	Single Node error Detail=00 00 00 11 Level=00 Type=04	Dismounting of file system failed.	Refer to the failure recovery procedure of Troubleshooting "Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	Single Node error Detail=00 00 00 20 Level=00 Type=04	Starting the NFS sharing failed.	Refer to the failure recovery procedure of Troubleshooting "Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	Single Node error Detail=00 00 00 21 Level=00 Type=04	Terminating the NFS sharing failed.	Refer to the failure recovery procedure of Troubleshooting "Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	Single Node error Detail=00 00 00 40 Level=00 Type=04	Startup of the CIFS service failed.	Refer to the failure recovery procedure of Troubleshooting "Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"

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Message ID	Message text	Description	Recovery method	Reference Page
(Continued) KAQK39601-E	Single Node error Detail=00 00 00 41 Level=00 Type=04	Stopping of the CIFS service failed.	Refer to the failure recovery procedure of Troubleshooting “Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure” and recover the failure.	“Troubleshooting ‘Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure’ (TRBL 09-0000)”
	Single Node error Detail=00 00 00 50 Level=00 Type=04	Startup of the File snapshot or the file version restore function failed.	Refer to the failure recovery procedure of Troubleshooting “Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure” and recover the failure.	“Troubleshooting ‘Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure’ (TRBL 09-0000)”
	Single Node error Detail=00 00 00 51 Level=00 Type=04	Stopping of the File snapshot or the file version restore function failed.	Refer to the failure recovery procedure of Troubleshooting “Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure” and recover the failure.	“Troubleshooting ‘Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure’ (TRBL 09-0000)”
	Single Node error Detail=00 00 00 F0 Level=00 Type=04	Startup of the resource on the single node failed.	Refer to the failure recovery procedure of Troubleshooting “Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure” and recover the failure.	“Troubleshooting ‘Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure’ (TRBL 09-0000)”
	Single Node error Detail=00 00 00 F1 Level=00 Type=04	Stopping of the resource on the single node failed.	Refer to the failure recovery procedure of Troubleshooting “Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure” and recover the failure.	“Troubleshooting ‘Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure’ (TRBL 09-0000)”

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Message ID	Message text	Description	Recovery method	Reference Page
KAQK39602-E	Virtual Server error Detail=00 00 01 10 Level=00 Type=04	Failed to mount the file system of the displayed Virtual Server ID.	Ask the system administrator for the enabling or disabling of the local data encryption and the HCP payload encryption. If the local data encryption is enabled, ask the system administrator to confirm one of the system messages KAQM05256-E, KAQM05258-E to KAQM05264-E, KAQM05323-E, KAQM05325-W has not been output. In case the one of the messages has been output, ask the system administrator to take an appropriate action. If no message has been output, or the local data encryption and the HCP payload encryption are disabled, refer to the failure recovery procedure of Troubleshooting "Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	Virtual Server error Detail=00 00 01 11 Level=00 Type=04	Failed to unmount (umount) the file system of the displayed Virtual Server ID.	Refer to the failure recovery procedure of Troubleshooting "Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	Virtual Server error Detail=00 00 01 20 Level=00 Type=04	Failed to start the NFS sharing of the displayed Virtual Server ID.	Refer to the failure recovery procedure of Troubleshooting "Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	Virtual Server error Detail=00 00 01 21 Level=00 Type=04	Failed to terminate the NFS sharing of the displayed Virtual Server ID.	Refer to the failure recovery procedure of Troubleshooting "Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	Virtual Server error Detail=00 00 01 30 Level=00 Type=04	Failed to make up the virtual IP of the displayed Virtual Server ID.	Refer to the failure recovery procedure of Troubleshooting "Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"
	Virtual Server error Detail=00 00 01 31 Level=00 Type=04	Failed to make down the virtual IP of the displayed Virtual Server ID.	Refer to the failure recovery procedure of Troubleshooting "Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure" and recover the failure.	"Troubleshooting 'Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure' (TRBL 09-0000)"

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Message ID	Message text	Description	Recovery method	Reference Page
(Continued) KAQK39602-E	Virtual Server error Detail=00 00 01 40 Level=00 Type=04	Failed to start the CIFS service of the displayed Virtual Server ID.	Refer to the failure recovery procedure of Troubleshooting “Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure” and recover the failure.	“Troubleshooting ‘Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure’ (TRBL 09-0000)”
	Virtual Server error Detail=00 00 01 41 Level=00 Type=04	Failed to stop the CIFS service of the displayed Virtual Server ID.	Refer to the failure recovery procedure of Troubleshooting “Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure” and recover the failure.	“Troubleshooting ‘Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure’ (TRBL 09-0000)”
	Virtual Server error Detail=00 00 01 50 Level=00 Type=04	Failed to start the File snapshot of the displayed Virtual Server ID or the file version restore function.	Refer to the failure recovery procedure of Troubleshooting “Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure” and recover the failure.	“Troubleshooting ‘Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure’ (TRBL 09-0000)”
	Virtual Server error Detail=00 00 01 51 Level=00 Type=04	Failed to stop the File snapshot of the displayed Virtual Server ID or the file version restore function.	Refer to the failure recovery procedure of Troubleshooting “Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure” and recover the failure.	“Troubleshooting ‘Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure’ (TRBL 09-0000)”
	Virtual Server error Detail=00 00 01 F0 Level=00 Type=04	Failed to start the Virtual Server resources of the displayed Virtual Server ID.	Refer to the failure recovery procedure of Troubleshooting “Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure” and recover the failure.	“Troubleshooting ‘Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure’ (TRBL 09-0000)”
	Virtual Server error Detail= 00 00 01 F1 Level=00 Type=04	Failed to stop the Virtual Server resources of the displayed Virtual Server ID.	Refer to the failure recovery procedure of Troubleshooting “Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure” and recover the failure.	“Troubleshooting ‘Chapter 9 Confirmation of Hardware Failure Recovery and Recovery Procedure for Software Failure’ (TRBL 09-0000)”

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Message ID	Message text	Description	Recovery method		Reference Page
KAQK39603-E	An attempt to connect user disk failed. (Detail=00 00 02 01 Level=00 Type=04)	Initialization process of the user disk failed.	Refer to the failure recovery procedure of Troubleshooting “9.2.3.1.3 Failure recovery of the blocked file system in the configuration connected to the disk array subsystem” and recover the failure.		“Troubleshooting ‘9.2.3.1.3 Failure recovery of the blocked file system in the configuration connected to the disk array subsystem’ (TRBL 09-0672)”
	An attempt to connect user disk failed. (Detail=00 00 02 02 Level=00 Type=04)	The configuration of user disk is invalid.	①	Execute fpstatus command, and reboot the OS if “Status” of all paths are “Online”. If any “Status” other than “Online” is included, proceed to step②.	“Maintenance Tool ‘2.5 Displaying the FC Status (fpstatus)’ (MNTT 02-0280)” “Maintenance Tool ‘2.29 Rebooting the OS of This Side Node (nasreboot)’ (MNTT 02-1790)”
			②	Refer to the failure recovery procedure of Troubleshooting “5.1 Determining FC Path Failures” and recover the failure.	“Troubleshooting ‘5.1 Determining FC Path Failures’ (TRBL 05-0000)”

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C.3.2 LCD Display Message Code

This is unsupported configuration in this mode.

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C.3.3 KAQX Messages

This model does not support relations with HCP Anywhere.

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D.1.15.1 Replacing the Lithium Battery (cluster configuration)
D.1.15.2 Replacing the Lithium Battery (single node configuration)
D.1.16 Replacing the PCI Riser Board
D.1.16.1 Replacing the PCI Riser Board (cluster configuration)
D.1.16.2 Replacing the PCI Riser Board (single node configuration)
D.1.17 Replacing the CPU Heatsink
D.1.17.1 Replacing the CPU Heatsink (cluster configuration)
D.1.17.2 Replacing the CPU Heatsink (single node configuration)
D.1.18 Replacing the CPU Air Duct
D.1.19 Replacing the Cable
D.1.19.1 Replacing the Cable (cluster configuration)
D.1.19.2 Replacing the Cable (single node configuration)
D.1.20 Replacing the BMC
D.1.21 Replacing the Management Port
D.1.22 Replacing the Internal RAID Battery
D.1.23 Replacing the USB Board
D.1.24 Replacing the SFP module
D.1.24.1 Replacing the SFP module (cluster configuration)
D.1.24.2 Replacing the SFP module (single node configuration)

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D.1 Replacing the Components

Table D.1-1 shows the parts to be replaced and the status of the OS operation to the node in replacement. The parts name of the hardware vendor is also shown in the following table because it must see “Maintenance Manual Hitachi Compute Rack 210HM [System Unit]” depends on the parts to be replaced.

Table 1-1 Parts to be Replaced and the Status of the OS Operation to the Node in Replacement (1/3)

No.	Component	Maintenance Manual Hitachi Compute Rack 210HM [System Unit] component name	Node configuration	Node OS operation status		Parts replacement	Approximate work time
				On (*2)	Off (*3)		
1	Power Supply unit	Power supply	Cluster configuration	Y (*1)	Y	‘D.1.1.1 Replacing the Power Supply Unit/ AC Cable (cluster configuration)’	30 minutes
2	Fan unit	FAN	Cluster configuration		Y	‘D.1.2.1 Replacing the Fan Unit (cluster configuration)’	30 minutes
3	Internal hard disk drive	HDD	Cluster configuration	Y (*1)	Y	‘D.1.3.1 Replacing the Internal Hard Disk Drive (cluster configuration)’	90 minutes
4	RAID Controller	RAID card	Cluster configuration	N	Y	‘D.1.4.1 Replacing the RAID Controller (cluster configuration)’	30 minutes
5	Memory	Memory board	Cluster configuration	N	Y	‘D.1.5.1 Replacing the Memory (cluster configuration)’	30 minutes
6	Fibre Channel Card	PCI Cards	Cluster configuration	N	Y	‘D.1.6.1 Replacing the Fibre Channel Card (cluster configuration)’	60 minutes
7	GbE-4Port Card 10GbE-1Port card 10GbE-2Port card	PCI Cards	Cluster configuration	N	Y	‘D.1.7.1 Replacing the GbE-4Port Card (cluster configuration)’	30 minutes
8	GbE-2Port Card (*4)	LAN mezzanine	Cluster configuration	N	Y	‘D.1.8.1 Replacing the GbE-2Port Card (cluster configuration)’	30 minutes

*1: Only in the case of one target failed part, it can be replaced while the power is turned on (in the case of two failed parts, they need to be replaced while the power is turned off).
*2: The node is in operation.
*3: A failover to the other node was performed and user service has been continued.
*4: LAN mezzanine. is the part to be replaced.

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Table 1-1 Parts to be Replaced and the Status of the OS Operation to the Node in Replacement (2/3)

No.	Component	Maintenance Manual Hitachi Compute Rack 210HM [System Unit] component name	Node configuration	Node OS operation status		Parts replacement	Approximate work time
				On (*2)	Off (*3)		
9	Motherboard	Mother board	Cluster configuration	N	Y	‘D.1.9.1 Replacing the Motherboard (cluster configuration)’	50 minutes
10	DVD Drive	DVD-ROM	Cluster configuration	N	Y	‘D.1.10.1 Replacing the DVD Drive (cluster configuration)’	30 minutes
11	CPU	CPU	Cluster configuration	N	Y	‘D.1.11.1 Replacing the CPU (cluster configuration)’	30 minutes
12	HDD Backplane board	HDD backplane	Cluster configuration	N	Y	‘D.1.12.1 Replacing the HDD Backplane board (cluster configuration)’	60 minutes

*2: The node is in operation.
*3: A failover to the other node was performed and user service has been continued.

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Table 1-1 Parts to be Replaced and the Status of the OS Operation to the Node in Replacement (3/3)

No.	Component	Maintenance Manual Hitachi Compute Rack 210HM [System Unit] component name	Node configuration	Node OS operation status		Parts replacement	Approximate work time
				On (*2)	Off (*3)		
13	Front Panel Board	Front panel board	Cluster configuration	N	Y	'D.1.13.1 Replacing the Front Panel Board (cluster configuration)'	30 minutes
14	PS Backboard	—	—	—	—	—	—
15	Lithium Battery	Lithium Battery	Cluster configuration	N	Y	'D.1.15.1 Replacing the Lithium Battery (cluster configuration)'	30 minutes
16	PCI Riser Board	PCI riser board	Cluster configuration	N	Y	'D.1.16.1 Replacing the PCI Riser Board (cluster configuration)'	30 minutes
17	CPU Heatsink	CPU Heatsink	Cluster configuration	N	Y	'D.1.17.1 Replacing the CPU Heatsink (cluster configuration)'	30 minutes
18	CPU Air Duct	—	Cluster configuration	N	Y	'D.1.18.1 Replacing the CPU Air Duct (cluster configuration)'	30 minutes
19	Cable	One of the followings : •SAS set Cable •Front Panel Cable •FAN Signal Cable •Front USB Cable •DVD SATA Cable •SGPIO Cable •HDD Power Cable	Cluster configuration	N	Y	'D.1.19.1 Replacing the Cable (cluster configuration)'	30 minutes
20	BMC	—	—	—	—	—	—
21	Management Port	—	—	—	—	—	—
22	Internal RAID Battery	—	—	—	—	—	—
23	LAN mezzanine	LAN mezzanine	Cluster configuration	N	Y	'D.1.8.1 Replacing the GbE-2Port Card (cluster configuration)'	30 minutes
24	USB board	—	—	—	—	—	—
25	SFP module	—	Cluster configuration	N	Y	'D.1.24.1 Replacing the SFP module (cluster configuration)'	10 minutes

*2: The node is in operation.
*3: A failover to the other node was performed and user service has been continued.

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D.1.1 Replacing the Power Supply Unit/ AC Cable

For the cluster configuration, refer to D.1.1.1 Replacing the Power Supply Unit/ AC Cable (cluster configuration). For the single node configuration, refer to ‘D.1.1.2 Replacing the Power Supply Unit/ AC Cable (single node configuration)’.

D.1.1.1 Replacing the Power Supply Unit/ AC Cable (cluster configuration)

Select either method:

Table D.1.1.1-1 Replacing a power supply unit

Method	Node status at replacement	Replacement procedure
1	The node is running.	(1) Replacement procedure while the node is in operation
2	The node is turned off.	(2) Replacement procedure while the node is turned off

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(1) Replacement procedure while the node is in operation

NOTE: When replacing AC cable, read the word of Power supply unit as AC cable.

(a) Check the hardware status. Check that “failed” is displayed for either 0 or 1 in “Power Supply Information” on the screen.
(For details about how to check the hardware status, refer to ‘B.3.1 Displaying the Hardware Status (hwstatus.)’)

(b) Refer to “Maintenance Manual Hitachi Compute Rack 210HM [System Unit]” and replace the power supply unit.

NOTE: Precautions for parts replacement
- When replacing power supply unit, replace it with the instruction described in “Maintenance Manual Hitachi Compute Rack 210HM [System Unit]”.
- Simple log acquisition instructed in “Maintenance Manual Hitachi Compute Rack 210HM [System Unit]” is unnecessary.

(c) After replacing the power supply unit, connect the power supply cable to check if the power source lamp is on in green. For the power supply lamp confirmation of the power supply unit, refer to “Maintenance Manual Hitachi Compute Rack 210HM [System Unit]”.

(d) Check the hardware status. Check whether “ok” is displayed for both 0 and 1 of “Power Supply Information” on the screen.
(For details about how to check the hardware status, refer to ‘B.3.1 Displaying the Hardware Status (hwstatus)’.)

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(2) Replacement procedure while the node is turned off

NOTE: When replacing AC cable, read the word of power supply unit as AC cable.

(a) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(b) Refer to "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" and replace the power supply unit.

NOTE: Precautions for parts replacement

- When replacing power supply unit, replace it with the instruction described in "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]", and confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series).
- Depend on the result of HATP, other possible suspect parts might be replaced. In this case, return to 'C.2.2.1 Failure determination procedure at the cluster configuration' and determine the subject parts.

(c) When the replacement of the power supply unit is done by removing all the cables, reconnect the cables to the location as it were, and check that the power supply lamp of the power supply unit is blinking in green light. For the power supply lamp of the power supply unit, refer to "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]".

NOTE: When there has been an instruction to let the heartbeat cable and maintenance port cable removed during operation before executing the replacement procedure, do not connect heartbeat cable and the maintenance port cable and just connect the other cables.

(d) Turn on the Power lamp switch, and check that the power supply lamp is turned on in green light. In the case of the light color is other than green, take measures in accordance with the description in "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]", and then check the power supply lamp again. This procedure is unnecessary when the node is started by connecting cables at (c).

(e) Confirm that the OS startup of the node is complete.
Refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (f).
If the login prompt window is displayed, proceed to the step (f).

(f) Confirm the node status on the other side.
To check, execute the peerstatus command on the other (normal) node and check whether the status is [BOOT COMPLETE]. For details about how to check node status, refer to "Maintenance Tool '2.36 Displaying the Status of Other Side Node (peerstatus)' (MNTT 02-2130)".

NOTE: Wait approximately 10 minutes until the OS is completely started.

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(g) Check the hardware status.
Check the hardware status. Check whether “ok” is displayed for both 0 and 1 of “Power Supply Information” on the screen.
For details about how to check the hardware status, refer to ‘B.3.1 Displaying the Hardware Status (hwstatus)’.

(h) Return to the step (f) of “Replacement ‘1.1.1 Replacing the Power Supply Unit/ AC Cable (2) Replacement procedure while the node is turned off’ (REP 01-0040)”, and execute the rest of the procedures.

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D.1.1.2 Replacing the Power Supply Unit/ AC Cable (single node configuration)

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D.1.2 Replacing the Fan Unit

For the cluster configuration, refer to D.1.2.1 Replacing the Fan Unit (cluster configuration).
For the single node configuration, refer to 'D.1.2.2 Replacing the Fan Unit (single node configuration)'.

D.1.2.1 Replacing the Fan Unit (cluster configuration)

(1) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Refer to "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" and replace the fan unit.

NOTE: Precautions for parts replacement
- When replacing fan unit, replace it with the instruction described in "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" and confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series).
- Depend on the result of HATP, the other possible suspect parts might be replaced. In this case, return to 'C.2.2.1 Failure determination procedure at the cluster configuration' and determine the subject parts.

(3) After replacing the fan unit, reconnect the cables where they were if they are all removed at the replacing operation, and press the power button on the node.

NOTE: When there has been an instruction to let the heartbeat cable and maintenance port cable removed during operation before executing the replacement procedure, do not connect heartbeat cable and the maintenance port cable and just connect the other cables.

(4) Confirm that the OS startup of the node is complete.
Refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (5). If the login prompt window is displayed, proceed to step (5).

(5) Confirm the node status on the other side.
To check, execute the peerstatus command on the other (normal) node and check whether the status is [BOOT COMPLETE].
For details about how to check node status, refer to "Maintenance Tool '2.36 Displaying the Status of Other Side Node (peerstatus)' (MNTT 02-2130)".

NOTE: Wait approximately 10 minutes until the OS is completely started.

(6) After the OS is started on the node, check the following item.
Check the hardware status. Check whether "ok" is displayed for all items of "FAN Information" on the screen. For details about how to check the hardware status, refer to 'B.3.1 Displaying the Hardware Status (hwstatus)'.

(7) Return to the step (e) of "Replacement '1.2.1 Parts replacement only when the node is turned off (cluster configuration)' (REP 01-0070)" and execute the rest of the procedures.

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D.1.2.2 Replacing the Fan Unit (single node configuration)

HDI does not support the single node configuration.

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D.1.3 Replacing the Internal Hard Disk Drive

For the cluster configuration, refer to D.1.3.1 Replacing the Internal Hard Disk Drive (cluster configuration).
For the single node configuration, refer to ‘D.1.3.2 Replacing the Internal Hard Disk Drive (single node configuration)’.

D.1.3.1 Replacing the Internal Hard Disk Drive (cluster configuration)

Select either method:

NOTE:
- Note that replacement of one internal hard disk drive must be performed while the node is in operation, and replacement of two internal hard disk drives must be performed while the node is turned off.
- Replacement of one internal hard disk drive is either failure replacement or preventive replacement.

Table D.1.3.1-1 Replacing internal hard disk drive

Method	Node status at replacement	Replacement procedure
1	The node is running (replacement of one internal HDD)	(1) Replacement procedure while the node is in operation (replacement of one internal HDD)
2	The node is turned off. (replacement of two internal HDDs)	(2) Replacement procedure while the node is turned off (replacement of two internal HDDs)

(1) Replacement procedure while the node is in operation (replacement of one internal HDD)

NOTE:
- Note that replacement of one internal hard disk drive must be performed while the node is in operation. It cannot be performed while the node is turned off.
- You can confirm the logs/status in the replacement while the node is in operation in the following procedures by executing the command of MegaRAID Storage Manager (CLI version.) Therefore, you do not need to install MegaRAID Storage Manager (GUI version) or perform the operations in MegaRAID Storage Manager (GUI version), as described in the manual Maintenance Manual Hitachi Compute Rack 210HM [System Unit].
  Remove the internal HDD to be replaced, and replace it with its maintenance part HDD.

(a) Check whether one of following SIM message is displayed. (Refer to “Maintenance Tool ‘2.6 Displaying SIMs on This Side (syseventlist)’ (MNTT 02-0360)”.)

- In the case of internal HDD failure, “KAQK30801-E MIACAT detected a failure (MAR=(MAR) RC=(RC))” is displayed. Therefore, confirm that if the RC is a failure code of the internal HDD with reference to “Maintenance Manual Hitachi Compute Rack 210HM [System Unit]”.

- In the case of internal HDD failure, check the status of the hardware, and confirm the “InternalHDD Information” on the window shows “failed” in either of 0 and 1. (for the confirmation of the hardware, refer to ‘B.3.1 Displaying the Hardware Status (hwstatus)’.

- In the case of internal HDD preventing replacement, check if “KAQK37512-E The number of internal RAID device media errors has exceeded the threshold.(internal_disk_number)” or “KAQK37514-E The number of internal RAID device S.M.A.R.T. warnings has exceeded the threshold (internal_disk_number)” is displayed on the window.
  The extension storage bay number for the HDD of the subject to be replaced becomes the value of internal_disk_number as shown in the above message +1.
  For the location of installing the extension storage bay, refer to ‘A.2.1 Front side’.

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(b) Refer to "Maintenance Tool '2.56 Status Information Acquisition of the Virtual Disk and the Physical Disk (state.sh)' (MNTT 02-3110)," and collect the status information of the current internal HDD.

(c) Refer to "Maintenance Tool '2.55 Embedded RAID Controller Internal Log Acquisition (log.sh)' (MNTT 02-3080)", and confirm the obtained log.

(d) Refer to "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" and execute internal hard disk drive replacement.

NOTE: Precautions for parts replacement
When replacing internal HDD, replace it with the instruction described in "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]".

(e) Refer to "Maintenance Tool '2.58 Confirmation of Rebuilding Progress of Physical Disk (rbldchk.sh)' (MNTT 02-3170)", and confirm the rebuilding progress.

(f) After replacing the internal HDD, confirm the following items.

- Confirm that the LED of internal HDD turns on in green light or turned off. For the confirmation of the LED of internal HDD, refer to "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]".

- In the case of internal HDD preventing replacement, check if "KAQK37513-I The number of internal RAID device media errors has been cleared. (internal_disk_number) " or "KAQK37515-I The number of internal RAID device S.M.A.R.T. warnings has been cleared (internal_disk_number) " is displayed on the window. (for the confirmation of the message, refer to "Maintenance Tool '2.6 Displaying SIMs on This Side (syseventlist)' (MNTT 02-0360)".

- Check the hardware status. Check whether "ok" is displayed for both 0 and 1 of "InternalHDD Information" on the screen.
  For details about how to check the hardware status, refer to 'B.3.1 Displaying the Hardware Status (hwstatus)'.

The confirmation of the above items are all OK, the replacement procedure is complete.

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(2) Replacement procedure while the node is turned off (replacement of two internal HDDs)

(a) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(b) Refer to "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]", and replace the internal HDD.
The power source must be stopped because the new installation is done after the replacement.

NOTE: Precautions for parts replacement

- When replacing internal HDD, replace it with the instruction described in "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" and confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series).
- Depend on the result of HATP, the other possible suspect parts might be replaced. In this case, return to 'C.2.2.1 Failure determination procedure at the cluster configuration' and determine the subject parts.
- Make sure to collect Simple log by using HATP before the replacement. For the details, refer to "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]."

(c) Execute newly installing the OS.
For the procedures, refer to "Set Up 'Chapter 3 New Installation' (SETUP 03-0000)".

(d) Perform settings after the installation is complete.
For the setting procedures, refer to "Set Up '5.1 Setting/ Confirmation after New Installation' (SETUP 05-0000)".

(e) Restore the OS.
For the procedures, refer to "Maintenance Tool '2.8 Recovering the Disk/Cluster Management LU (syslurestore)' (MNTT 02-0460)".

(f) Confirm that the OS startup of the node is completed.
Refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (g.)
If the login prompt window is displayed, proceed to the step (g.)

(g) Confirm the node status on the other side.
To check, execute the peerstatus command on the other (normal) node and check whether the status is [BOOT COMPLETE].
For details about how to check node status, refer to "Maintenance Tool '2.36 Displaying the Status of Other Side Node (peerstatus)' (MNTT 02-2130)".

NOTE: Wait approximately 10 minutes until the OS is completely started.

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(h) After the OS is started on the node, check the following items.

- Confirm that the LED of internal HDD turns on in green light or turned off.
  For details about the color of the LEDs, refer to “Maintenance Manual Hitachi Compute Rack 210HM [System Unit]”.

- Check the hardware status. Check whether “ok” is displayed for both 0 and 1 of “InternalHDD Information” on the screen.
  For details about how to check the hardware status, refer to ‘B.3.1 Displaying the Hardware Status (hwstatus)’.

(i) Return to the step (f) of the “Replacement ‘1.3.1 Replacing the Internal Hard Disk Drive (2) Replacement procedure while the node is turned off (replacement of two internal HDDs)’ (REP 01-0130)” and execute the rest of the procedures.

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D.1.3.2 Replacing the Internal Hard Disk Drive (single node configuration)

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D.1.4 Replacing the RAID Controller

For the cluster configuration, refer to D.1.4.1 Replacing the RAID Controller (cluster configuration).
For the single node configuration, refer to 'D.1.4.2 Replacing the RAID Controller (single node configuration)'.

D.1.4.1 Replacing the RAID Controller (cluster configuration)

(1) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Refer to "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" and replace the RAID controller.

NOTE: Precautions for parts replacement

- When replacing RAID controller, replace it with the instruction described in "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" and confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series).
- Depend on the result of HATP, the other possible suspect parts might be replaced. In this case, return to 'C.2.2.1 Failure determination procedure at the cluster configuration' and determine the subject parts.
- Make sure to collect Simple log by using HATP before the replacement. For the details, refer to "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]."
- Write mode before replacement is taken over to the write mode after replacement. Write through will be set in VD0 (OS LU).

(3) After replacing the RAID controller, reconnect the cables where they were if they are all removed at the replacing operation, and press the power button on the node.

NOTE: When there has been an instruction to let the heartbeat cable and maintenance port cable removed during operation before executing the replacement procedure, do not connect heartbeat cable and the maintenance port cable and just connect the other cables.

(4) Confirm that the OS startup of the node is completed.
Refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (5.)
If the login prompt window is displayed, proceed to the step (5.)

(5) Check status of the other node.
To check, execute the peerstatus command on the other (normal) node and check whether the status is [BOOT COMPLETE].
For details about how to check node status, refer to "Maintenance Tool '2.36 Displaying the Status of Other Side Node (peerstatus)' (MNTT 02-2130)".

NOTE: Wait approximately 10 minutes until the OS is completely started.

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(6) Confirm the firmware version of the RAID controller.
Refer to "Maintenance Tool '2.46 Confirming the Built-in RAID Controller Firmware Version (internalraidfwget)' (MNTT 02-2610)," and check the firmware version of the RAID controller.
For the version confirmation, refer to Version Management Table (Web).
When the firmware version of the RAID controller is the version that is required to update, refer to "Maintenance Tool '2.47 Updating the Built-in RAID Controller Firmware (internalraidfwupdate)' (MNTT 02-2640)," and update the firmware.
When the firmware version of the RAID controller does not require updating, proceed to step (7).

(7) Return to the step (e) of "Replacement '1.2.1 Parts replacement only when the node is turned off (cluster configuration)' (REP 01-0070)" and execute the rest of the procedures.

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D.1.4.2 Replacing the RAID Controller (single node configuration)

HDI does not support the single node configuration.

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D.1.5 Replacing the Memory

For the cluster configuration, refer to D.1.5.1 Replacing the Memory (cluster configuration).
For the single node configuration, refer to 'D.1.5.2 Replacing the Memory (single node configuration)'.

D.1.5.1 Replacing the Memory (cluster configuration)

(1) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Refer to "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" and replace the memory.

NOTE: Precautions for parts replacement

- When replacing memory, replace it with the instruction described in "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" and confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series).
- Depend on the result of HATP, the other possible suspect parts might be replaced. In this case, return to 'C.2.2.1 Failure determination procedure at the cluster configuration' and determine the subject parts.
- Make sure to collect Simple log by using HATP before the replacement. For the details, refer to "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]."

(3) After replacing the memory, reconnect the cables where they were if they are all removed at the replacing operation, and press the power button on the node.

NOTE: When there has been an instruction to let the heartbeat cable and maintenance port cable removed during operation before executing the replacement procedure, do not connect heartbeat cable and the maintenance port cable and just connect the other cables.

(4) Confirm that the OS startup of the node is complete.
Refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (5). If the login prompt window is displayed, proceed to step (5).

(5) Confirm the node status on the other side.
To check, execute the peerstatus command on the other side (normal) node and check whether the status is [BOOT COMPLETE].
For details about how to check node status, refer to "Maintenance Tool '2.36 Displaying the Status of Other Side Node (peerstatus)' (MNTT 02-2130)".

NOTE: Wait approximately 10 minutes until the OS is completely started.

(6) After the OS is started on the node, check the hardware status. Confirm whether "installed" is displayed for the status of where the memory replacement was executed in "Memory Information" on the screen. (For details about how to check the hardware status, refer to 'B.3.1 Displaying the Hardware Status (hwstatus)'.)

(7) Return to the step (e) of "Replacement '1.2.1 Parts replacement only when the node is turned off (cluster configuration)' (REP 01-0070)"and execute the rest of procedures.

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D.1.5.2 Replacing the Memory (single node configuration)

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D.1.6 Replacing the Fibre Channel Card

For the cluster configuration, refer to D.1.6.1 Replacing the Fibre Channel Card (cluster configuration).
For the single node configuration, refer to ‘D.1.6.2 Replacing the Fibre Channel Card (single node configuration)’.

D.1.6.1 Replacing the Fibre Channel Card (cluster configuration)

(1) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to “Maintenance Tool ‘2.28 Terminating the OS of This Side Node (nasshutdown)’ (MNTT 02-1740)”.
When replacing FC card due to occurrence of cluster management LU failure or the both paths failures of the target node, execute nasshutdown command with “—force” option attached.
When the setting of host group security mode is enabled, execute the operation from the step (2).
When the setting of host group security mode is disabled, execute the operation from the step (3).

(2) Record WWNs corresponding to the both FC ports of the ordered service part because changing the WWNs is required after replacing parts.

(a) In the case of Emulex HBA
- The Fibre Channel card has one WWN corresponding to the “PORT 0” and the other WWN corresponding to the “PORT 1”, which are written after the “IEEE ADDRESS” in the back of the card. Make sure you clearly identify the WWN of each port.
- A port with smaller port name is “PORT 0.”
(e.g., when the port names are fc0002 and fc0003, fc0002 is “PORT 0.”)
- Each WWN written on the Fibre Channel card consists of 12 digits and the first four digits (1000) are omitted. Therefore, when you record a WWN, add 1000 at the beginning and make sure the WWN is 16 digits.

(b) In the case of Hitachi HBA
- A WWN for “PORT 0” (a 16-digit hexadecimal number: 5000xxxx xxxxxxxx) is labeled on the side of the Fibre Channel cable inlet.
- WWN for “PORT 1” can be calculated by adding 2 to the WWN for “PORT 0.”
(e.g., when WWN for “PORT 0” is “5000xxxx xxxx0A29,” WWN for “PORT 1” is “5000xxxx xxxx0A2B.”)
- A port with smaller port name is “PORT 0.”
(e.g., when the port names are fc0002 and fc0003, fc0002 is “PORT 0.”)

(3) Disconnect all the Fibre Channel cables from the Fibre Channel card.

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(4) Refer to “Maintenance Manual Hitachi Compute Rack 210HM [System Unit]” and replace the Fibre Channel card.
After the replacement, the power source must be stopped because the connection of Fibre Channel cable and the setting of the host group security are required to be set.

NOTE: Precautions for parts replacement

- When replacing the Fibre Channel card to be installed in the expansion slot 2, replace the standard bracket that attached to the maintenance part with the Low Profile bracket and screws that attached to the failure part.
- When replacing the Fibre Channel card, replace it with the instruction described in “Maintenance Manual Hitachi Compute Rack 210HM [System Unit]” and confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series).
- Depend on the result of HATP, the other possible suspect parts might be replaced. In this case, return to ‘C.2.2.1 Failure determination procedure at the cluster configuration’ and determine the subject parts.
- Make sure to collect Simple log by using HATP before the replacement. For the details, refer to “Maintenance Manual Hitachi Compute Rack 210HM [System Unit].”

(5) When the setting of host group security mode is enabled, write down the WWNs of the parts that are removed at the step (4).
When the setting of the host group security mode is disabled, execute the operation from the step (8).

NOTE: In the case of Emulex HBA, each WWN written on the Fibre Channel card consists of 12 digits and the first four digits (1000) are omitted. Therefore, when you record a WWN, add 1000 at the beginning and make sure the WWN is 16 digits.

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(6) To change the WWNs registered to the connection ports on the disk array subsystem, refer to "LUN Manager User's Guide" for the AMS2000 series or HUS100 series, and if USP V, USP VM, VSP, VSP G1000, or HUS VM is connected, refer to "5.3.1.4. LUN Management" in the installation section of the maintenance manual of each system, and if VSP Gx00/VSP Fx00 is connected, refer to "System Administrator Guide" for VSP Gx00/VSP Fx00. To change the WWNs, delete the WWNs recorded in step (5) and then register the WWNs recorded in step (2). Change the WWN registered for each connection destination port.

(7) After completion of step (6), if the FC-SW is not used, skip this step. If the FC-SW is used, request the system administrator to change the FC-SW WWN zoning by deleting the WWN that you took a note of in step (5) and registering the WWN that you took a note of in step (2).

(8) After replacing the Fibre Channel card and changing the WWNs, connect the Fibre Channel cables to the new Fibre Channel card and press the power button on the node. If the cables are all removed at the replacing operation, reconnect them where they were and press the power button on the node.

NOTE: When there has been an instruction to let the heartbeat cable and maintenance port cable removed during operation before executing the replacement procedure, do not connect heartbeat cable and the maintenance port cable and just connect the other cables.

(9) After the OS is started, log in the node from the maintenance PC. It normally takes approximately 10 minutes until the OS is completely started.
For the login, refer to "Maintenance Tool '1.3.2 Logging in to a node for executing commands' (MNTT 01-0200)".

NOTE: You can log in the node from the maintenance PC even if communication with the array was not restored after the FC card replacement. However, in that case, do not execute the commands that affect cluster operation such as clstatus command, etc.

(10) Confirm that the port of Fibre Channel card linked up.
- Check the LED statuses on the new Fibre Channel card. Make sure at least one port is linked up. Refer to "Maintenance Manual Hitachi Compute Rack [I/O Adapter]" for how to check the LED indication.

(11) Execute fpstatus command. If "Status" of both paths is "Error", do not execute the rest of the procedures, return to Troubleshooting where you were originally referring to and execute the rest of the procedures there. For the fpstatus command, refer to "Maintenance Tool '2.5 Displaying the FC Status (fpstatus)' (MNTT 02-0280)".

(12) Check the version of the firmware. For the version confirmation, refer to the version control table (Web). Depending on the version of the firmware, you may need to downgrade the firmware.
For details about how to check the version of firmware, refer to "Maintenance Tool '2.24 Checking the HBA Firmware Version (fchbafwlist)' (MNTT 02-1600)".

(13) When the version of the firmware is appropriate, go to step (15).
If the version of the firmware is inappropriate, downgrade the firmware. For details about how to downgrade firmware, refer to "Maintenance Tool '2.25 Updating the HBA Firmware (fchbafwupdate)' (MNTT 02-1630)".

(14) After you downgrade the firmware, check its version.

(15) Return to the step (e) of "Replacement '1.2.1 Parts replacement only when the node is turned off (cluster configuration)' (REP 01-0070)", and execute the rest of the procedures.

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D.1.6.2 Replacing the Fibre Channel Card (single node configuration)

HDI does not support the single node configuration.

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D.1.7 Replacing the GbE-4Port Card

For the cluster configuration, refer to D.1.7.1 Replacing the GbE-4Port Card (cluster configuration).
For the single node configuration, refer to 'D.1.7.2 Replacing the GbE-4Port Card (single node configuration)'.

D.1.7.1 Replacing the GbE-4Port Card (cluster configuration)

NOTE:
- 10GbE-1Port card is not supported for this model.
- When replacing GbE-2Port card, read "GbE-4Port card" as "GbE-2Port card."

(1) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Disconnect all the LAN cables from the GbE-4Port card.

(3) Refer to "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" and replace the GbE-4Port card.
After the replacement, the power source must be stopped because the cables are required to be connected.

NOTE: Precautions for parts replacement
- When replacing GbE-4Port card, replace it with the instruction described in "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" and confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series).
- Depend on the result of HATP, the other possible suspect parts might be replaced. In this case, return to 'C.2.2.1 Failure determination procedure at the cluster configuration' and determine the subject parts.
- Make sure to collect Simple log by using HATP before the replacement. For the details, refer to "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]."

(4) After replacing the GbE-4Port card, reconnect the cables where they were if they are all removed at the replacing procedure, and press the power button on the node.

NOTE: Be sure to reconnect the LAN cables to the same ports as before.

(5) Confirm that the OS startup of the node is complete.
Refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (6).
If the login prompt window is displayed, proceed to the step (6).

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(6) Confirm the node status on the other side.
To check, execute the peerstatus command on the other (normal) node and check whether the status is [BOOT COMPLETE].
For details about how to check node status, refer to "Maintenance Tool '2.36 Displaying the Status of Other Side Node (peerstatus)' (MNTT 02-2130)".

NOTE: Wait approximately 10 minutes until the OS is completely started.

(7) After the OS is started, check the following.
Check the hardware status. Check whether "up" is displayed for the ports used in the new card in "Network Interface" on the screen. For details about how to check the hardware status, refer to 'B.3.1 Displaying the Hardware Status (hwstatus)'.

(8) Return to the step (e) of "Replacement '1.2.1 Parts replacement only when the node is turned off (cluster configuration)' (REP 01-0070)" and execute the rest of the procedures.

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D.1.7.2 Replacing the GbE-4Port Card (single node configuration)

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D.1.8 Replacing the GbE-2Port Card

Replace the LAN mezzanine.

For the cluster configuration, refer to D.1.8.1 Replacing the GbE-2Port Card (cluster configuration).

D.1.8.1 Replacing the GbE-2Port Card (cluster configuration)

(1) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Disconnect all the LAN cables from the LAN mezzanine
In the BMC direct connection configuration, also disconnect LAN cables from the reset port.

(3) Refer to "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" and replace the LAN mezzanine.
After the replacement, the power source must be stopped because the cables are required to be connected.

NOTE: Precautions for parts replacement

- When replacing LAN mezzanine, replace it with the instruction described in "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" and confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series).
- Depend on the result of HATP, the other possible suspect parts might be replaced. In this case, return to 'C.2.2.1 Failure determination procedure at the cluster configuration' and determine the subject parts.
- Make sure to collect Simple log by using HATP before the replacement. For the details, refer to "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]."

(4) After replacing the LAN mezzanine, reconnect the cables where they were if they are all removed at the replacing procedure. In the BMC direct connection configuration, also reconnect the reset port cable. After reconnect the cables, turn on the power lamp.

NOTE:
- Be sure to reconnect the LAN cables to the same ports as before. In the BMC direct connection configuration, also reconnect the reset port cable to the same port as before.
- When there is an instruction to let the reset port cable removed during operation, do not connect the reset port cable.

(5) Confirm that the OS startup of the node is complete.
Refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (6).
If the login prompt window is displayed, proceed to the step (6).

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(6) Confirm the node status on the other side.
To check, execute the peerstatus command on the other (normal) node and check whether the status is [BOOT COMPLETE].
For details about how to check node status, refer to "Maintenance Tool '2.36 Displaying the Status of Other Side Node (peerstatus)' (MNTT 02-2130)".

NOTE: Wait approximately 10 minutes until the OS is completely started.

(7) After the OS is started, check the following.
Check the hardware status. Check whether the status of "mng0" of "Network Interface" on the screen is displayed as "up". In the BMC direct connection configuration, also check that the status of "pm1" is "up."
For details about how to check the hardware status, refer to 'B.3.1 Displaying the Hardware Status (hwstatus)'.

(8) Return to the step (e) of "Replacement '1.2.1 Parts replacement only when the node is turned off (cluster configuration)' (REP 01-0070)" and execute the rest of the procedures.

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D.1.8.2 Replacing the GbE-2Port Card (single node configuration)

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D.1.9 Replacing the Motherboard

For the cluster configuration, refer to D.1.9.1 Replacing the Motherboard (cluster configuration).
For the single node configuration, refer to 'D.1.9.2 Replacing the Motherboard (single node configuration)'.

D.1.9.1 Replacing the Motherboard (cluster configuration)

NOTE:
- Prior to the replacement of the motherboard stated in this section, a confirmation whether the SIM message (KAQG72026-E) for the forced failover has been output to the other side of the node or not, needs to be finished.
  If the confirmation has not been finished yet, check the SIM message on the other side of the node and also if the message "KAQG72026-E" has been output, execute 'C.2.2.1 Failure determination procedure at the cluster configuration' again. For the confirmation of SIM message, refer to "Maintenance Tool '2.6 Displaying SIMs on This Side (syseventlist)' (MNTT 02-0360)".
- BMC setting must be the same before the replacement of the motherboard because the communication might not be available if the different BMC setting is done.

(1) The replacement of the motherboard requires confirming and resetting the BMC. Therefore, confirm the BMC setting information, and write down the setting information. For the confirmation of the BMC setting, execute bmcctl command. If it is not available to log in to the node to be replaced, execute from the other side node. For more information about bmcctl command, refer to "Maintenance Tool '2.18 Setting BMC LAN Information (bmcctl)' (MNTT 02-1210)".

(2) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(3) Disconnect all the external cables connected to the node (LAN cable, FC cable.)
Write down the connecting point of the cables to reconnect them after parts replacement.

(4) Refer to "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" and replace the motherboard. After replacing it, reconnect all the cables except for network cables.

NOTE: Precautions for parts replacement
- Follow the instruction described in "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" to replace the motherboard and confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series.)
- Some results of HATP lead to additional possible suspect part replacement. In this case, return to 'C.2.2.1 Failure determination procedure at the cluster configuration' and determine the part to be replaced.
- The following operations shown in "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" are not necessary. (For the HDI products, they will be set in the post-procedure or OS)
  - Resetting time of the motherboard as instructed in the maintenance manual for FRU/LAN Config Restore.
  - Resetting of BMC IP address when FRU/LAN Config Restore cannot be executed.
- Make sure to collect Simple log by using HATP before replacement. For details, refer to "Maintenance Manual Hitachi Compute Rack 210HM [System Unit.]"

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(5) Check the place to connect the cables that are written down at the step (3), and reconnect all the cables to the node.

NOTE: When there has been an instruction to let the heartbeat cable and maintenance port cable removed during operation before executing the replacement procedure, do not connect heartbeat cable and the maintenance port cable and just connect the other cables.

(6) Check the BIOS version.
Check the BIOS version by referring to 'B.2.1 BIOS Version Checking Procedure,' and write down it as a record of the work.

(7) Check the BMC firmware version.
Check the BMC firmware version by referring to 'B.2.2 BMC Firmware Version Checking Procedure,' and write down it as a record of the work.

(8) Refer to 'B.2.7 Confirmation of CPU Virtualization Support Mechanism' and confirm the virtualization support mechanism of the CPU.

(9) Set the time of BIOS by any method of the following.

(a) Execute the timeget-u command in the node that has not been replaced, and set the displayed UTC time for BIOS. For the timeget command, refer to "Maintenance Tool '2.42 Acquisition of Time/Time Zone (timeget)' (MNTT 02-2430)".
For setting the BIOS time, refer to 'B.2.4 Set the Time in BIOS'.

(b) Refer to "Set Up '9.1 UTC-based Time Setting' (SETUP 09-0000)", and acquire the UTC time from the maintenance PC and set the time of BIOS.

(10) Confirm that the OS startup of the node is complete.
Refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (11).
If the login prompt window is displayed, proceed to the step (11).

(11) Check the information of the BMC interface. Check if the information is not changed with the written information before replacing the motherboard.
If the information has been changed, set to the information as the written information before replacing the mother board again.
For the setting of the BMC interface information, refer to "Maintenance Tool '2.18 Setting BMC LAN Information (bmcctl)' (MNTT 02-1210)".

NOTE: If the operation instruction to remove heartbeat cable and management cable has been given in the Troubleshooting / Troubleshooting by each Model of this manual prior to the execution of the replacement procedure, confirmation and setting f the BMC interface information are not required. They will be executed in the Troubleshooting section.

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(12) Execute the timeget command in the both node with no option specifying, and check that the present time matches in the both nodes. For the confirmation of the present time, make sure that the "Year, month, date, hour, and minute" are matched. For the present time confirmation, refer to "Maintenance Tool '2.18 Setting BMC LAN Information (bmcctl)' (MNTT 02-1210)".
If they are not matched, write down the present time on the node of not replaced, and set the time again with the timeset command for the node that executed the replacement. Rebooting is required after the time setting. For the setting of the present time, refer to "Maintenance Tool '2.43 Time Setting (timeset)' (MNTT 02-2470)".

(13) After completion of step (12), check the following.
Check the hardware statuses on the both nodes to confirm that both the "status" and "connection" of "BMC Information" in the window are "ok". (For checking the hardware status, refer to 'B.3.1 Displaying the Hardware Status (hwstatus)'.

NOTE:
- If under the recovery of the dual failure, confirm that the "status" in "BMC Information" of the motherboard replaced node shows "ok".

Refer to 'B.2.9 Other Setting/Confirmation Items (1) Confirmation of the setting of Hyper-threading' and confirm that the setting of Hyper-threading is [Disabled].

If the operation instruction to remove heartbeat cable and management cable has been given in the Troubleshooting / Troubleshooting by each Model of this manual prior to the execution of the replacement procedure, return to the part replacement section of the Troubleshooting instead of proceeding to the step (14).

(14) Return to the step (e) of "Replacement '1.2.1 Parts replacement only when the node is turned off (cluster configuration)' (REP 01-0070)", and execute the rest of the procedures.

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D.1.9.2 Replacing the Motherboard (single node configuration)

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D.1.10 Replacing the DVD Drive

For the cluster configuration, refer to D.1.10.1 Replacing the DVD Drive (cluster configuration).
For the single node configuration, refer to 'D.1.10.2 Replacing the DVD Drive (single node configuration)'.

D.1.10.1 Replacing the DVD Drive (cluster configuration)

(1) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Refer to "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" and replace the DVD drive.

NOTE: Precautions for parts replacement
- When replacing DVD drive, replace it with the instruction described in "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" and confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series).
- Depend on the result of HATP, the other possible suspect parts might be replaced. In this case, return to 'C.2.2.1 Failure determination procedure at the cluster configuration' and determine the subject parts.

(3) After replacing the DVD drive, reconnect the cables where they were if they are all removed at the replacing operation, and press the power button on the node.

NOTE: When there has been an instruction to let the heartbeat cable and maintenance port cable removed during operation before executing the replacement procedure, do not connect heartbeat cable and the maintenance port cable and just connect the other cables.

(4) Confirm that the OS startup of the node is complete.
Refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (5).
If the login prompt window is displayed, proceed to the step (5).

(5) Check whether the OS is completely started on the node. To check, execute the peerstatus command on the other (normal) node and check whether the status is [BOOT COMPLETE].
For details about how to check node status, refer to "Maintenance Tool '2.36 Displaying the Status of Other Side Node (peerstatus)' (MNTT 02-2130)".

NOTE: Wait approximately 10 minutes until the OS is completely started.

(6) Return to the step (e) of "Replacement '1.2.1 Parts replacement only when the node is turned off (cluster configuration)' (REP 01-0070)" and execute the rest of the procedures.

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D.1.10.2 Replacing the DVD Drive (single node configuration)

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D.1.11 Replacing the CPU

For the cluster configuration, refer to D.1.11.1 Replacing the CPU (cluster configuration).
For the single node configuration, refer to 'D.1.11.2 Replacing the CPU (single node configuration)'.

D.1.11.1 Replacing the CPU (cluster configuration)

(1) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Disconnect all the external cables connected to the node (LAN cable, FC cable, and AC cable.)
Write down the connecting point of the cables to reconnect them after parts replacement.

(3) Refer to "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" and replace the CPU.

NOTE: Precautions for parts replacement

- Follow the instruction described in "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" to replace the CPU and confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series.)
- Some results of HATP lead to additional possible suspect part replacement. In this case, return to 'C.2.2.1 Failure determination procedure at the cluster configuration' and determine the part to be replaced.
- Make sure to collect Simple log by using HATP before replacement. For details, refer to "Maintenance Manual Hitachi Compute Rack 210HM [System Unit.]"

(4) Connect all the cables to the node.
After replacing the CPU, reconnect the cables to the original position if they were removed before replacing, and press the power button on the node.

NOTE: When there has been an instruction to let the heartbeat cable and maintenance port cable removed during operation before executing the replacement procedure, do not connect heartbeat cable and the maintenance port cable and just connect the other cables.

(5) Confirm that the OS startup of the node is complete.
Refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (6).
If the login prompt window is displayed, proceed to the step (6).

NOTE: Wait approximately 10 minutes until the OS is completely started.

(6) Confirm the status of the other node.
Execute the peerstatus command on the other (normal) node to check whether the status is [BOOT COMPLETE]. For details about how to check node status, refer to "Maintenance Tool '2.36 Displaying the Status of Other Side Node (peerstatus)' (MNTT 02-2130)".

(7) Return to the step (e) of "Replacement '1.2.1 Parts replacement only when the node is turned off (cluster configuration)' (REP 01-0070)" and execute the rest of the procedures.

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D.1.11.2 Replacing the CPU (single node configuration)

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D.1.12 Replacing the HDD Backplane Board

For the cluster configuration, refer to D.1.12.1 Replacing the HDD Backplane Board (cluster configuration).
For the single node configuration, refer to 'D.1.12.2 Replacing the HDD Backplane Board (single node configuration)'.

D.1.12.1 Replacing the HDD Backplane Board (cluster configuration)

(1) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Refer to "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" and replace the HDD Backplane Board.

NOTE: Precautions for parts replacement
- When replacing HDD Backplane Board, replace it with the instruction described in "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" and confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series).
- Depend on the result of HATP, the other possible suspect parts might be replaced. In this case, return to 'C.2.2.1 Failure determination procedure at the cluster configuration' and determine the subject parts.

(3) After replacing the HDD Backplane Board, reconnect the cables where they were if they are all removed at the replacing operation, and press the power button on the node.

NOTE: When there has been an instruction to let the heartbeat cable and maintenance port cable removed during operation before executing the replacement procedure, do not connect heartbeat cable and the maintenance port cable and just connect the other cables.

(4) Confirm that the OS startup of the node is complete.
Refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (5).
If the login prompt window is displayed, proceed to the step (5).

(5) Confirm the node status on the other side.
To check, execute the peerstatus command on the other (normal) node and check whether the status is [BOOT COMPLETE].
For details about how to check node status, refer to "Maintenance Tool '2.36 Displaying the Status of Other Side Node (peerstatus)' (MNTT 02-2130)".

NOTE: Wait approximately 10 minutes until the OS is completely started.

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(6) After the OS is started, check the following.
Check the hardware status. Check whether “ok” is displayed for the status of 0 and 1 of “InternalHDD Information” on the screen. For details about how to check the hardware status, refer to ‘B.3.1 Displaying the Hardware Status (hwstatus)’.

(7) Return to the step (e) of “Replacement ‘1.2.1 Parts replacement only when the node is turned off (cluster configuration)’ (REP 01-0070)” and execute the rest of the procedures.

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D.1.12.2 Replacing the HDD Backplane Board (single node configuration)

HDI does not support the single node configuration.

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D.1.13 Replacing the Front Panel Board

For the cluster configuration, refer to D.1.13.1 Replacing the Front Panel Board (cluster configuration).
For the single node configuration, refer to 'D.1.13.2 Replacing the Front Panel Board (single node configuration)'.

D.1.13.1 Replacing the Front Panel Board (cluster configuration)

(1) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Disconnect all the external cables connected to the node (LAN cable, FC cable, and AC cable.)
Write down the connecting point of the cables to reconnect them after parts replacement.

(3) Refer to "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" and replace the Front Panel Board.
After the replacement, the power source must be stopped because cable reconnection is required.

NOTE: Precautions for parts replacement
- Follow the instruction described in "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" to replace the Front Panel Board and confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series.)
- Some results of HATP lead to additional possible suspect part replacement. In this case, return to 'C.2.2.1 Failure determination procedure at the cluster configuration' and determine the part to be replaced.

(4) After replacing the Front Panel Board, reconnect the cables to the original position if they were removed before replacing, and press the power button on the node.

NOTE: When there has been an instruction to let the heartbeat cable and maintenance port cable removed during operation before executing the replacement procedure, do not connect heartbeat cable and the maintenance port cable and just connect the other cables.

(5) Confirm that the OS startup of the node is complete.
Refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (6).
If the login prompt window is displayed, proceed to the step (6).

(6) Confirm the node status on the other side.
To check, execute the peerstatus command on the other (normal) node and check whether the status is [BOOT COMPLETE].
For details about how to check node status, refer to "Maintenance Tool '2.36 Displaying the Status of Other Side Node (peerstatus)' (MNTT 02-2130)".

NOTE: Wait approximately 10 minutes until the OS is completely started.

(7) Return to the step (e) of "Replacement '1.2.1 Parts replacement only when the node is turned off (cluster configuration)' (REP 01-0070)" and execute the rest of the procedures.

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D.1.13.2 Replacing the Front Panel Board (single node configuration)

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D.1.14 Replacing the PS Backboard

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D.1.15 Replacing the Lithium Battery

For the cluster configuration, refer to D.1.15.1 Replacing the Lithium Battery (cluster configuration).
For the single node configuration, refer to ‘D.1.15.2 Replacing the Lithium Battery (single node configuration)’.

D.1.15.1 Replacing the Lithium Battery (cluster configuration)

(1) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to “Maintenance Tool ‘2.28 Terminating the OS of This Side Node (nasshutdown)’ (MNTT 02-1740)”.

(2) Refer to “Maintenance Manual Hitachi Compute Rack 210HM [System Unit]” and replace the Lithium Battery.

NOTE: Precautions for parts replacement

- When replacing Lithium Battery, replace it with the instruction described in “Maintenance Manual Hitachi Compute Rack 210HM [System Unit]” and confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series).
- Depend on the result of HATP, the other possible suspect parts might be replaced. In this case, return to ‘C.2.2.1 Failure determination procedure at the cluster configuration’ and determine the subject parts.
- Make sure to collect Simple log by using HATP before the replacement. For the details, refer to “Maintenance Manual Hitachi Compute Rack 210HM [System Unit].”

(3) After replacing the Lithium Battery, reconnect the cables where they were if they are all removed at the replacing operation, and press the power button on the node.

NOTE: When there has been an instruction to let the heartbeat cable and maintenance port cable removed during operation before executing the replacement procedure, do not connect heartbeat cable and the maintenance port cable and just connect the other cables.

(3-1) Refer to ‘B.2.7 Confirmation of CPU Virtualization Support Mechanism’ and verify CPU virtualization support mechanism.

(4) Confirm that the OS startup of the node is complete.
Refer to “Set Up ‘1.3 Startup Confirmation of the OS by using KVM’ (SETUP 01-0010)” and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to ‘C.2.4 Diagnosis for OS Boot Failure’ and execute the solution to the failure. After the failure is solved, proceed to the step (5).
If the login prompt window is displayed, proceed to the step (5).

(5) Confirm the node status on the other side.
To check, execute the peerstatus command on the other (normal) node and check whether the status is [BOOT COMPLETE].
For details about how to check node status, refer to “Maintenance Tool ‘2.36 Displaying the Status of Other Side Node (peerstatus)’ (MNTT 02-2130)”.

NOTE: Wait approximately 10 minutes until the OS is completely started.

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(6) Confirm the time of the node.
Execute the timeget command in the both node with no option specifying, and check that the present time matches in the both nodes. For the confirmation of the present time, make sure that the "Year, month, date, hour, and minute" are matched. For the present time confirmation, refer to "Maintenance Tool '2.42 Acquisition of Time/ Time Zone (timeget)' (MNTT 02-2430)".
If they are not matched, write down the present time on the node of not replaced, and set the time again with the timeset command for the node that executed the replacement. Rebooting is required after the time setting. For the setting of the present time, refer to "Maintenance Tool '2.43 Time Setting (timeset)' (MNTT 02-2470)".

(7) Return to the step (e) of "Replacement '1.2.1 Parts replacement only when the node is turned off (cluster configuration)' (REP 01-0070)" and execute the rest of the procedures.

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D.1.15.2 Replacing the Lithium Battery (single node configuration)

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D.1.16 Replacing the PCI Riser Board

For the cluster configuration, refer to D.1.16.1 Replacing the Lithium Battery (cluster configuration).
For the single node configuration, refer to 'D.1.16.2 Replacing the PCI Riser Board (single node configuration)'.

D.1.16.1 Replacing the PCI Riser Board (cluster configuration)

(1) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Refer to "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" and replace the PCI Riser Board.

NOTE: Precautions for parts replacement

- When replacing PCI Riser Board, replace it with the instruction described in "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" and confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series).
- There are two kinds in the PCI Riser Board: PCI Riser Board (Standard side) and PCI Riser Board (Lowprofile side.) For which PCI Riser Board is the target to be replaced, follow the instruction of "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]".
- Depend on the result of HATP, the other possible suspect parts might be replaced. In this case, return to 'C.2.2.1 Failure determination procedure at the cluster configuration' and determine the subject parts.
- Make sure to collect Simple log by using HATP before the replacement. For the details, refer to "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]."

(3) After replacing the PCI Riser Board, reconnect the cables where they were if they are all removed at the replacing operation, and press the power button on the node.

NOTE: When there has been an instruction to let the heartbeat cable and maintenance port cable removed during operation before executing the replacement procedure, do not connect heartbeat cable and the maintenance port cable and just connect the other cables.

(4) Confirm that the OS startup of the node is complete.
Refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (5).
If the login prompt window is displayed, proceed to the step (5).

(5) Confirm the node status on the other side.
To check, execute the peerstatus command on the other (normal) node and check whether the status is [BOOT COMPLETE].
For details about how to check node status, refer to "Maintenance Tool '2.36 Displaying the Status of Other Side Node (peerstatus)' (MNTT 02-2130)".

NOTE: Wait approximately 10 minutes until the OS is completely started.

(6) Return to the step (e) of "Replacement '1.2.1 Parts replacement only when the node is turned off (cluster configuration)' (REP 01-0070)" and execute the rest of the procedures.

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D.1.16.2 Replacing the PCI Riser Board (single node configuration)

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D.1.17 Replacing the CPU Heatsink

For the cluster configuration, refer to D.1.17.1 Replacing the CPU Heatsink (cluster configuration).
For the single node configuration, refer to 'D.1.17.2 Replacing the CPU Heatsink (single node configuration)'.

D.1.17.1 Replacing the CPU Heatsink (cluster configuration)

(1) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Disconnect all the external cables connected to the node (LAN cable, FC cable, and AC cable.)
Write down the connecting point of the cables to reconnect them after parts replacement.

(3) Refer to "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" and replace the CPU Heatsink..

NOTE: Precautions for parts replacement
- Follow the instruction described in "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" to replace the CPU Heatsink and confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series.)
- Some results of HATP lead to additional possible suspect part replacement. In this case, return to 'C.2.2.1 Failure determination procedure at the cluster configuration' and determine the part to be replaced.

(4) After replacing the CPU Heatsink, reconnect the cables to the original position if they were removed before replacing, and press the power button on the node.

NOTE: When there has been an instruction to let the heartbeat cable and maintenance port cable removed during operation before executing the replacement procedure, do not connect heartbeat cable and the maintenance port cable and just connect the other cables.

(5) Confirm that the OS startup of the node is complete.
Refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (6).
If the login prompt window is displayed, proceed to the step (6).

(6) Check whether the OS is completely started on the node. To check, execute the peerstatus command on the other (normal) node and check whether the status is [BOOT COMPLETE].
For details about how to check node status, refer to "Maintenance Tool '2.36 Displaying the Status of Other Side Node (peerstatus)' (MNTT 02-2130)".

NOTE: Wait approximately 10 minutes until the OS is completely started.

(7) Return to the step (e) of "Replacement '1.2.1 Parts replacement only when the node is turned off (cluster configuration)' (REP 01-0070)" and execute the rest of the procedures.

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D.1.17.2 Replacing the CPU Heatsink (single node configuration)

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D.1.18 Replacing the CPU Air Duct

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D.1.19 Replacing the Cable

For the cluster configuration, refer to D.1.19.1 Replacing the Cable (cluster configuration).
For the single node configuration, refer to 'D.1.19.2 Replacing the Cable (single node configuration)'.
The various cables indicate that any of SAS set Cable, Front panel cable, FAN Signal Cable, Front USB Cable, DVD SATA Cable, SGPIO Cable or HDD Power Cable connected inside the node.
For the LAN cable connected outside of the node, refer to "Replacement '1.5 Replacing the LAN Cable' (REP 01-0200)", and for FC cable, refer to "Replacement '1.4 Replacing the Fibre Channel Cable' (REP 01-0160)".

D.1.19.1 Replacing the Cable (cluster configuration)

(1) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)".

(2) Disconnect all the external cables connected to the node (LAN cable, FC cable, and AC cable.)
Write down the connecting point of the cables to reconnect them after parts replacement.

(3) Refer to "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" and replace the cable to be replaced.

NOTE: Precautions for parts replacement
- Follow the instruction described in "Maintenance Manual Hitachi Compute Rack 210HM [System Unit]" to replace cables and confirm the operation after the replacement by using HATP (a program that executes operation confirmation and executes determination when a failure occurs on HA8000 series.)
- Some results of HATP lead to additional possible suspect part replacement. In this case, return to 'C.2.2.1 Failure determination procedure at the cluster configuration' and determine the part to be replaced.

(4) After replacing the cable, reconnect the cables to the original position if they were removed before replacing, and press the power button on the node.

NOTE: When there has been an instruction to let the heartbeat cable and maintenance port cable removed during operation before executing the replacement procedure, do not connect heartbeat cable and the maintenance port cable and just connect the other cables.

(5) Confirm that the OS startup of the node is complete.
Refer to "Set Up '1.3 Startup Confirmation of the OS by using KVM' (SETUP 01-0010)" and confirm that the login prompt window is displayed.
If the login prompt window is not displayed and a boot failure window is displayed, the OS startup was not successful because another failure occurred. Refer to 'C.2.4 Diagnosis for OS Boot Failure' and execute the solution to the failure. After the failure is solved, proceed to the step (6).
If the login prompt window is displayed, proceed to the step (6).

(6) Check whether the OS is completely started on the node. To check, execute the peerstatus command on the other (normal) node and check whether the status is [BOOT COMPLETE].
For details about how to check node status, refer to "Maintenance Tool '2.36 Displaying the Status of Other Side Node (peerstatus)' (MNTT 02-2130)".

NOTE: Wait approximately 10 minutes until the OS is completely started.

(7) Return to the step (e) of "Replacement '1.2.1 Parts replacement only when the node is turned off (cluster configuration)' (REP 01-0070)" and execute the rest of the procedures.

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D.1.19.2 Replacing the Cable (single node configuration)

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D.1.20 Replacing the BMC

Refer to ‘D.1.9 Replacing the Motherboard’, and execute the replacement of the motherboard.

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D.1.21 Replacing the Management Port

Refer to ‘D.1.8 Replacing the GbE-2Port Card’, and execute the replacement of the GbE-2Port card.

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D.1.22 Replacing the Internal RAID Battery

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D.1.23 Replacing the USB Board

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D.1.24 Replacing the SFP module

NOTE:
- The SFP module can be replaced only when Hitachi HBA is used.
- Only the preventive replacement is supported.
- Always start the replacement from "Replacement '1.2 Parts Replacement only when the Node is Turned Off ' (REP 01-0070)".

D.1.24.1 Replacing the SFP module (cluster configuration)

(1) Stop the OS on the target node.
For details about how to stop the OS on a node, refer to "Maintenance Tool '2.28 Terminating the OS of This Side Node (nasshutdown)' (MNTT 02-1740)."

(2) Disconnect Fibre Channel cables from all of the SFP modules to be replaced.

NOTE: Perform marking or take other measures so as to reconnect the cables properly.

(3) Replacing the SFP module
In the case of the preventive replacement for multiple SFP modules, repeat the steps from (3-1) to (3-3).

(3-1) Hold and open the bale clasp of the SFP module, referring to Figure D.1.24.1-1.

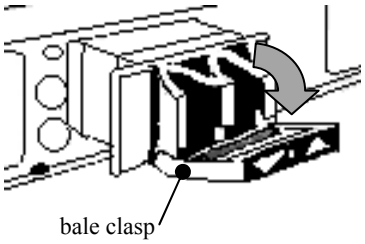

Figure D.1.24.1-1 SFP module replacement 1

(3-2) As shown in Figure D.1.24.1-2, pull out the SFP module gently in a horizontal direction from the Fibre Channel card.

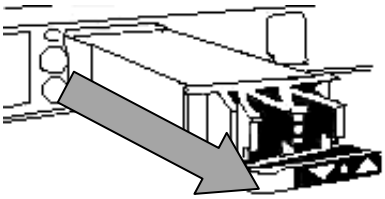

Figure D.1.24.1-2 SFP module replacement 2

(3-3) Gently insert the SFP module with the bale clasp unopened until a click sound is generated. Make sure that the SFP module is securely fixed.
Lightly press the SFP module for double checking.

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(4) Reconnect the cables that have been disconnected in step (2).

NOTE: If a FC-SW is used, port zoning might be applied, so make sure that the cables are connected to the appropriate ports.

(5) Turn the Power lamp on.
Log in the node from the maintenance PC after the OS is started up. Normally it takes approximately 10 minutes until the start up of the OS is complete.
Refer to "Maintenance Tool '1.3.2 Logging in to a node for executing commands' (MNTT 01-0200)" for logging in.

(6) Verify that the port of the installed SFP module is in the link-up state by mean of the LED indication on the SFP module. Refer to "Maintenance Manual Hitachi Compute Rack [I/O Adapter]" for how to check the LED indication.

(7) Execute the fpstatus command. Refer to "Maintenance Tool '2.5 Displaying the FC Status (fpstatus)' (MNTT 02-0280)" for the fpstatus command.
If "Status" of the path is "Error," verify the cable connection (erroneous wiring and connecting condition) again.

(8) Return to the step (e) of "Replacement '1.2.1 Parts replacement only when the node is turned off (cluster configuration)' (REP 01-0070)" and execute the rest of the procedures.

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D.1.24.2 Replacing the SFP module (single node configuration)

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D.2 Appendix.A A Node Replacement Procedure

CR210HM does not support the procedure that replaces one node.

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